General Geology Report 65

1974

CAVES OF SOUTHEASTERN PENNSYLVANIA

Compiled by
J. R. Reich, Jr.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
Arthur A. Socolow, State Geologist

Digitized by the Internet Archive
in 2016 with funding from
This project is made possible by a grant from the Institute of Museum and Library Services as administered by the Pennsylvania Department of Education through the Office of Commonwealth Libraries

https://archive.org/details/cavesofsoutheast00unse

General Geology Report 65

CAVES OF SOUTHEASTERN PENNSYLVANIA

compiled by J. R. Reich, Jr.

PENNSYLVANIA GEOLOGICAL SURVEY
FOURTH SERIES
HARRISBURG

1974

Copyright 1974
by the
Commonwealth of Pennsylvania
Quotations from this book may be published if credit
is given to the Pennsylvania Geological Survey

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PURCHASED FROM
STATE BOOK STORE, P. O. BOX 1365
HARRISBURG, PENNSYLVANIA 17125

Dedicated to the Memory of
Dr. Ralph W. Stone,
Pennsylvania's Pioneer Speleologist

PREFACE

The subject of caves has widespread interest among geologists concerned with cave origin and distribution, speleologists and the public interested in exploration and the esthetic wonders of caves, and engineers concerned with the impact of cave occurrences upon various construction projects.

When Dr. Ralph Stone's excellent and popular book on "Pennsylvania Caves" (Pennsylvania Geological Survey Bulletin G 3) went out of print a couple of years ago, it was recognized that a revision was desirable so that the many new cave discoveries could be included. This publication is the first volume of such an up-date, with others for the remainder of the Pennsylvania area expected to be completed in the near future. The authors are commended for their efforts and dedication to the subject.

Arthur A. Socolow
State Geologist

CONTENTS

	Page
Introduction	1
Geology of Southeastern Pennsylvania, by D. M. Lapham	2
Physiography	2
Geologic Provinces	4
Structure and Orogeny	5
Cave Formation	7
Adams County	11
Devils Den Cave, by Peter M. Hauer	11
Bucks County	13
Dean Cave	13
Durham Cave No. 1, by B. Nagy	13
Durham Cave No. 2, by B. Nagy	15
Chester County	15
Bazaillion's Cave, by David N. Brison	15
Paula's Pit	17
Delaware County	17
Castle Rock	17
Lancaster County	19
Abe Buzzard's Cave, by David N. Brison	19
Billmyer East Cave, by David N. Brison	19
Cassell's Cave, by J. R. Reich, Jr.	19
Chickies Rock Retreat, by J. R. Reich, Jr.	20
Climber's Run Shelter Caves, by J. R. Reich, Jr.	20
County Home Cave, by J. R. Reich, Jr.	20
Danville Pike Cave and Solution Pocket, by J. R. Reich, Jr.	20
Devil's Hole Boulder Caves, by David N. Brison	20
Donegal Cave, by J. R. Reich, Jr.	23
Donnerville Cave, by J. R. Reich, Jr.	23
Erb's Mill Shelter Caves, by J. R. Reich, Jr.	23
Fallen Rock Shelter, by David N. Brison	25
Gable Cave (Indian Cave), by J. R. Reich, Jr.	25
Garber Cave, by J. R. Reich, Jr.	26
Gehman Cave, by David N. Brison	26
Governor's Stables, by David N. Brison	27
Hess Shelter Cave, by J. R. Reich, Jr.	28
Horst Cave, by J. R. Reich, Jr.	30
Kinzers Cave, by Bernard L. Smeltzer	32
Kurtz Quarry Cave No. 1, by David N. Brison	32
Kurtz Quarry Cave No. 2, by David N. Brison	34
Lampeter Cave, by J. R. Reich, Jr.	34
Landis Quarry Cave, by J. R. Reich, Jr.	37

Page

Leaman Cave, by J. R. Reich, Jr. . . . 40
Lititz Springs Caves, by J. R. Reich, Jr. . . . 40
Martin Cave, by J. R. Reich, Jr. . . . 42
Middle Creek Cave, by J. R. Reich, Jr. . . . 44
Mount Hope Boulder Caves, by David N. Brison . . . 44
Mount Joy Cave No. 1 (Cove Cave), by J. R. Reich, Jr. . . . 44
Mount Joy Cave No. 2, by David N. Brison . . . 47
Mount Joy Caves No. 3, 4 and 5, by J. R. Reich, Jr. . . . 49
Mount Pleasant Cave, by J. R. Reich, Jr. . . . 51
Mummau Cave No. 1, by J. R. Reich, Jr. . . . 51
Mummau Cave No. 2, by David N. Brison . . . 57
Nissley Cave, by J. R. Reich, Jr. . . . 57
Peck's Cave . . . 60
Pequea Church Caves, by David N. Brison . . . 61
Phil's Cave, by J. R. Reich, Jr. . . . 62
Red Hill Cave, by David N. Brison and J. R. Reich, Jr. . . . 63
Refton Cave, by J. R. Reich, Jr. . . . 65
Reynolds Cave, by Bernard L. Smeltzer . . . 67
Rineer Cave, by J. R. Reich, Jr. . . . 68
Saint Mary's Church Cave, by David N. Brison . . . 70
Seibel Cave, by David N. Brison . . . 72
Sheep Rock Shelter Cave, by David N. Brison . . . 72
Silver Hill Boulder Cave, by David N. Brison . . . 72
Snyder Caves, by David N. Brison . . . 76
Stackstown Cave, by David N. Brison . . . 76
Strasburg Cave, by Bernard L. Smeltzer . . . 76
Utility Cave, by J. R. Reich, Jr. . . . 78
Wind Cave (Cold Cave), by George F. Jackson . . . 78
Wolf Rock Cave . . . 83
Wyeth Cave, by David N. Brison . . . 83
Montgomery County . . . 86
Conshohocken Cave . . . 86
Port Kennedy Caves . . . 86
Schuylkill Cave . . . 86
Swedeland Cave . . . 87
Valley Forge Caves . . . 87
Other Caves . . . 87
Philadelphia County . . . 88
Cave of the Wissahickon . . . 88
Gorgas Lane Cave . . . 88
Miquon Caves . . . 88
Strawberry Mansion Cave . . . 88
Other Caves . . . 89

Page

York County . . . 89
Bootlegger Sink, by B. L. Smeltzer . . . 89
Colmoru Cave, by H. Rudisill . . . 91
Conglomerate Cave, by C. Miller and K. Miller . . . 91
Crystal Pit Cave, by R. W. Stone . . . 93
Devil's Hole Rock Shelter, by B. L. Smeltzer . . . 93
East York Cave, by B. L. Smeltzer . . . 95
Emigs Cave, by B. L. Smeltzer . . . 97
Lisburn Cave, by R. W. Stone . . . 98
Marble Cave, by B. L. Smeltzer . . . 99
North York Cave, by B. L. Smeltzer . . . 101
Pigeon Cave, by B. L. Smeltzer . . . 102
Railroad Rock House, by B. L. Smeltzer . . . 104
Sandy Cave, by B. L. Smeltzer . . . 105
St. Mark's Cave, by W. Cline . . . 107
Taxville Quarry Caves, by B. L. Smeltzer . . . 107
Thomasville Quarry Cave, by J. R. Reich, Jr. . . . 111
West York Cave, by B. L. Smeltzer . . . 111
Williams Grove Caves, by R. W. Stone . . . 113
Willis Run Pit, by Peter Hauer and Jim Young . . . 113
Yellow Breeches Cave, by R. W. Stone . . . 115
References . . . 115
Glossary . . . 116

ILLUSTRATIONS

FIGURES

Figure 1. Map showing Physiographic Provinces of Pennsylvania . . . 3
2. Devil's Den Cave . . . 12
3. Durham Cave No. 1 . . . 14
4. Durham Cave No. 2 . . . 16
5. Donnerville Cave . . . 24
6. Hess Shelter Cave . . . 29
7. Horst Cave . . . 31
8. Kinzers Cave . . . 32
9. Kurtz Quarry Cave No. 1 . . . 33
10. Kurtz Quarry Cave No. 2 . . . 35
11. Lampeter Cave . . . 36
12. Landis Quarry Cave . . . 38
13. Sketch of keyhole passage in Landis Quarry Cave . . . 39
14. Leaman Cave . . . 41

Page

Figure 15. Martin Cave 43
16. Middle Creek Cave 45
17. Mount Joy Cave No. 2 48
18. Mount Joy Caves No. 3, 4 and 5 50
19. Mt. Pleasant Cave 52
20. Entrance of Mummau Cave No. 1 53
21. Main Gallery in Mummau Cave No. 1 54
22. Sketch of anthodite from Mummau Cave No. 1 55
23. Anthodites in Mummau Cave No. 1 56
24. Mummau Cave No. 2 58
25. Nissley Cave 59
26. Phil's Cave 63
27. Stalactites and stalagmites of ice in entrance of Red Hill Cave 65
28. Specimen of isopod from Refton Cave 66
29. Reynold's Cave 69
30. St. Mary's Church Cave 71
31. Seibel Cave 73
32. Silver Hill Boulder Cave 74
33. Strasburg Cave 77
34. Utility Cave 79
35. Main entrance of Wind Cave (Cold Cave) 81
36. Bootlegger Sink 90
37. Colmoru Cave 92
38. Crystal Pit Cave 94
39. Devil's Hole Rock Shelter 95
40. East York Cave 96
41. Marble Cave 100
42. Pigeon Cave 103
43. Railroad Rock House 105
44. Sandy Cave 106
45. St. Mark's Cave 108
46. Thomasville Quarry Cave 110
47. Willis Run Pit 114

PLATES

(in envelope)

Plate 1. Gable Cave
2. Gehman Cave
3. Lititz Springs Caves
4. Mount Joy Cave No. 1
5. Mummau Cave No. 1

Plate 6. Pequea Church Caves
7. Red Hill Cave
8. Refton Cave
9. Rineer Cave
10. Wind Cave (Cold Cave)
11. Wyeth Cave
12. Emigs Cave
13. Lisburn Cave
14. North York Cave
15. Taxville Quarry Caves
16. West York Cave
17. New Extension of West York Cave

TABLES

Page

Table 1. Locations of Southeastern Pennsylvania Caves 9
2. Caves Found in Lancaster County Carbonate Rocks 17

CAUTION

TO THE EXPLORER

This publication describes and locates many caves in southeastern Pennsylvania. If you use this book as a guide for recreational caving please remember that your fate and the fate of caving as a sport in Pennsylvania depends on your cooperation and recognition of three principles.

1. MOST CAVES ARE ON PRIVATE PROPERTY. Caves belong to the land owner. You should visit them only with his expressed consent and permission. You are in his cave as his guest. Many caves in Pennsylvania are off-limits to all because of the thoughtless discourtesies of a few.
2. CAVES ARE DELICATE. The fragile beauty of the underworld can be destroyed with a few careless movements. Litterbugging in caves is no more to be tolerated than it is in parks and woodlands. Also, take no animals, plants or minerals from any cave.
3. CAVES ARE POTENTIALLY DANGEROUS. Sport caving is practiced by thousands throughout the United States with great enjoyment. However, inadequate equpiment or overconfidence in your skills can lead to accidents even in "easy" caves. Pennsylvania's two caving fatalities occurred in "safe" caves. Be careful.

CAVES OF SOUTHEASTERN PENNSYLVANIA

Compiled by

J. R. Reich, Jr.

INTRODUCTION

The caves of southeastern Pennsylvania's Piedmont Region are numerous and varied. They range from short solution tubes in limestone to one of the largest tectonic caves in the world. At this point one might question the meaning of the word "cave". Is the broad-entranced, shallow rock shelter a cave? Can the openings between large boulders be called caves? Is it a cave if the channel is completely filled with water, clay or shattered rock? Is it a cave if it can only be entered for a few feet? Even if all these instances are excluded, one finds that there are still many subterranean openings into which one may enter and explore. This report mentions all types of caves—from simple rock shelters to complex limestone caverns. Special consideration is given, however, to limestone caves since this type is most prevalent and therefore most easily studied.

The first modern publication which generally described Piedmont Region caves was *Pennsylvania Caves* by the late Dr. Ralph W. Stone of the Pennsylvania Bureau of Topographic and Geologic Survey. Dr. Stone's pioneering work in speleology, published in 1932 as General Geology Report 3, included 12 caves in the Piedmont Region. Over 20 years passed before a revision took place in the form of *Caves of Pennsylvania* by Dr. R. W. Stone. That publication, Bulletin 15 of the National Speleological Society, described 30 caves within the Region. In 1956 an article by Bernard L. Smeltzer in the monthly bulletin of the Pennsylvania Department of Internal Affairs described an additional ten caves found in southeastern Pennsylvania. Since Smeltzer's report of 1956, no additional information has been printed on the caves of this area, although many caves have been discovered. This report will attempt to describe these new caves, and will review those caves previously described.

Many of the caves described in this report are on private property. Wherever possible, the owners of the caves and their addresses are listed. *Permission should always be obtained from the owner before entering the cave.* This is a basic courtesy to the owner and is also a provision that someone knows that you are in the cave. It's no fun to be lost or perhaps hurt in a cave, especially if no one knows your whereabouts! Treat the cave-owner's property as if it were your own; mistreated cave owners seldom welcome back cave explorers.

This report is based on a field study commenced in 1960 by J. R. Reich, Jr. David N. Brison joined the study shortly thereafter and it has continued to the present time. Numerous people have accompanied the authors in the field and it would be impossible to list them all here. Special thanks is due however, to the members of the Speleo-Research Associates team, the members of the York Grotto, and especially to J. Schober, K. A. McKain, E. Shelly, Jr., D. Ibberson, and D. McGill for their superb assistance in the field. I would also like to acknowledge the help and suggestions in preparing the final manuscript of the members are reproduced here, and Naomi Groff who spent many hours at the Jr., and Bernard L. Smeltzer whose excellent maps and illustrations of the Pennsylvania Topographic and Geologic Survey, of Earl Shelly, typewriter.

GEOLOGY OF SOUTHEASTERN PENNSYLVANIA

by

D. M. Lapham

PHYSIOGRAPHY

The Piedmont, Blue Ridge, and New England-Reading Prong provinces of Pennsylvania occupy the entire southeast corner of the state (Figure 1). The northern boundary of the Piedmont Province extends from just west of Gettysburg, near the Maryland State Line, northeastward to south of Easton at the New Jersey State Line. The Blue Ridge Province, on the northwest side of the Piedmont, extends from Waynesboro to Dillsburg. The Reading Prong, on the northeast side of the Piedmont, extends from near Reading to Easton.

The relief of the area is rather slight with small, rolling hills and a few flat valleys dominating the landscape. The relief in any one area seldom exceeds a few hundred feet. Exceptions occur in the deep gorges of major rivers, such as the Susquehanna River, and where resistant ridges are adjacent to lower and rather flat valleys. The elevation of

ERRATA SHEET

G 65 Caves of Southeastern Pennsylvania

Page 2, paragraph 2 should read as follows:

This report is based on a field study commenced in 1960 by J. R. Reich, Jr. David N. Brison joined the study shortly thereafter and it has continued to the present time. Numerous people have accompanied the authors in the field and it would be impossible to list them all here. Special thanks is due however, to the members of the Speleo-Research Associates team, the members of the York Grotto, and especially to J. Schober, K. A. McKain, E. Shelly, Jr., D. Ibberson, and D. McGill for their superb assistance in the field. I would also like to acknowledge the help and suggestions in preparing the final manuscript of the members of the Pennsylvania Topographic and Geologic Survey, of Earl Shelly, Jr., and Bernard L. Smeltzer whose excellent maps and illustrations are reproduced here, and Naomi Groff who spent many hours at the typewriter.

Page 4, the last paragraph should read as follows:

The rocks of the extreme southeast often are referred to as rocks belonging to the inner Piedmont. Two age groups and lithologic types are known: the Precambrian mafic and granitic gneisses about 1100 my (million years) old and the late Precambrian to early Paleozoic metavolcanics, marble, schist, quartzite, slate, pegmatites, and serpentinite between 600 my and 400 my old. A large area of the latter group is referred to as rocks of the Glenarm Series whose age has been much disputed and still is not clearly understood. These rocks are bounded on the north by the Martic Line which separates them from younger Piedmont rocks to the north. All of the lithologies in this inner Piedmont have been subjected to several episodes of metamorphism and structural deformation. They presently form the eroded core of the Appalachian Mountains.

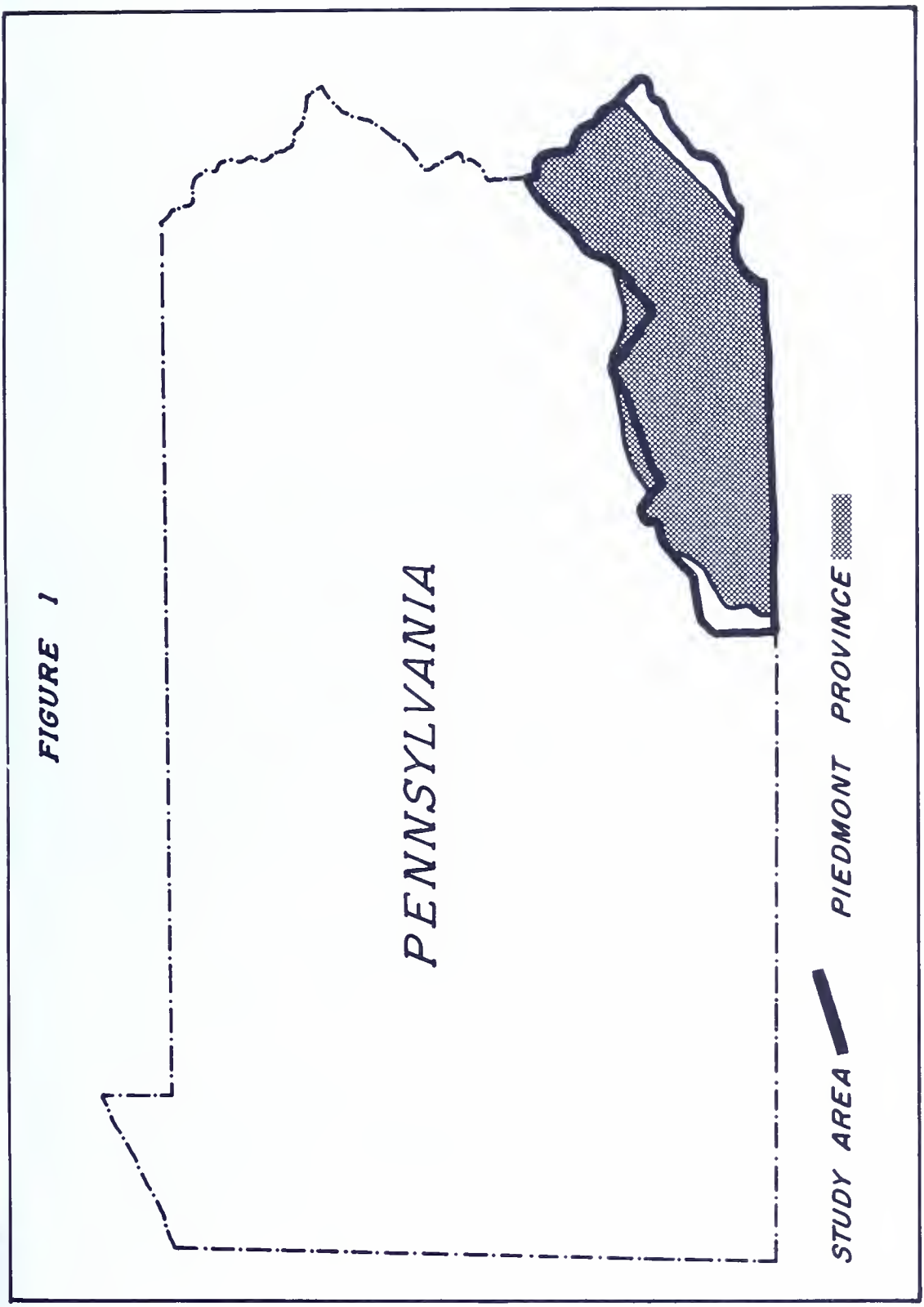


FIGURE 1

most areas is below 1000′ and commonly less than 500′. The drainage in the area is to the southeast into major rivers such as the Delaware, the Schuylkill, and the Susquehanna, each of which flows eastward into the Atlantic Ocean. These, and the minor streams that feed them, are still cutting down through bedrock and hence range from an early stage of maturity to late maturity as evidenced by occasional meanders.

The general topography of southeastern Pennsylvania is primarily a function of the nature of the rock types and secondarily a function of the geologic structures present. For example, resistant rock types such as diabase, quartzite, and granitic gneiss tend to form ridges; limestone, dolomite, and shale form valleys; and the rolling hills commonly are schist, phyllite, siltstone, and other rock types of intermediate resistance to erosion. Faults, joints, cleavages and folds are linear structures which have modified and in some places controlled, the direction of stream flow and the ease of downcutting.

GEOLOGIC PROVINCES

Within southeastern Pennsylvania, there are three geologic provinces and several sub-provinces. Each is distinctive in its geologic age range, lithologic types and structures. The formation of caves, their extent, and their shape are in part controlled by these province types. The Piedmont, which is the most extensive here, consists of 1) meta-sedimentary and meta-igneous rocks in the extreme southeast, 2) adjacent carbonate rocks of the valleys to the north, and 3) Triassic sedimentary red beds that form the northern Piedmont boundary. Small areas of Precambrian and lower Paleozoic rocks are called the Reading Prong (on the northeast) and South Mountain, or Blue Ridge (on the southwest); the geology of these areas will not be discussed in detail here. Interested readers are referred to the List of Publications of the Bureau of Topographic and Geologic Survey.

The rocks of the extreme southeast often are referred to as rocks belonging to the inner Piedmont. Two age groups and lithologic types are known: the Precambrian mafic and granitic gneisses about 1100 my (million years) old and the late Precambrian to early Paleozoic metavolcanics, marble, schist, quartzite, slate, pegmatites, and serpentinite between 600 my and 400 my old. A large area of the latter group is referred to as rocks of the Glenarm Series whose age has been much disputed and still is not clearly understood. These rocks are bounded on mont rocks to the north. All of the lithologies in this inner Piedmont have the north by the Martic Line which separates them from younger Piedbeen subjected to several episodes of metamorphism and structural deformation. They presently form the eroded core of the Appalachian Mountains.

Immediately to the north, and between the inner Piedmont rocks to the south and the much younger Triassic rocks to the north, lie the carbonate valley rocks and some quartzites interbedded with phyllitic or schistose beds. These rocks extend in a narrow belt from west of York northeastward to near Norristown. The carbonates are limestones and dolomites of Cambrian to Ordovician age, metamorphosed to marble in part. Original layers of shale have been metamorphosed to phyllite or schist and occur as beds within many of the carbonate rocks. Knots of quartz, sulfide mineralization, and recrystallization of the carbonate minerals into secondary calcite or dolomite characterize many areas in these carbonate units. In addition, clay and feldspar are rather common in most units, especially along relict bedding planes, in solution cavities, along joints and in residual deposits.

The upper Triassic rocks (about 190-210 my old) of southeastern Pennsylvania form a continuous belt from Adams County northeastward into Bucks County. They consist of gently northwest-dipping, predominantly red, unmetamorphosed mudstones, sandstones, and conglomerates. Only adjacent to intrusive igneous diabase are they bleached and metamorphosed to hornfels. In contrast with other rocks of the Piedmont which represent deep oceanic and shelf deposits, the Triassic rocks formed under semi-arid conditions, as deltaic deposits, and in small lagoonal basins or swamps.

Both the Reading Prong and the South Mountain areas contain considerable amounts of Precambrian rock between 820 and 890 my old, and perhaps 1100 my old in the Reading Prong. Included in them are pegmatites, granitic gneiss, amphibolite, hornblende gneiss, schist, metarhyolite, and metabasalt. Cambrian quartzite and some carbonate rocks are present in both areas. Locally, the Paleozoic limestones have been faulted and folded in amongst the metamorphosed igneous rocks. Rocks of both areas border Triassic rocks along the north Triassic margin where the contact is in part a fault and in part an unconformity.

STRUCTURE AND OROGENY

The structures that resulted from multiple deformation are complex throughout southeastern Pennsylvania. With the exception of the Triassic rocks, all have participated in several episodes of deformation and metamorphism from Precambrian time through the Paleozoic and into Mesozoic time. Consequently, earlier-formed structures have been deformed by later tectonism. Metamorphic recrystallizations (and metasomatism) have altered the original mineralogy and are superimposed. Regional metamorphism generally increased southward and eastward in the inner Piedmont. In addition, contact metamorphism near igneous plutons and

dynamic metamorphism from local deformational strain are evident at many localities.

The inner Piedmont contains folded and faulted domes of Precambrain gneiss partially re-injected into younger, overlying metasedimentary rocks. The deep water clastics of the younger metasediments, along with eugeosynclinal volcanic rocks, have been intruded by ultramafic, mafic, and granitic igneous rocks. All of the lithologies (except along fold axes) dip steeply, either to the southeast or to the northwest. Several cleavages from different periods of deformation have been recognized, faults are common and some extend for tens of miles, folds are tight and commonly overturned, and contacts between igneous and metasedimentary units commonly are sheared. The northern boundary of the inner Piedmont is the Martic Line where there is a sharp lithologic contrast with the carbonate rocks to the north. This Line also may be a structural break (i.e., a fault), although such a discontinuity has not yet been finally proved and many structures (i.e., cleavages) cross the Line.

Like the inner Piedmont, the rocks of the carbonate valleys are multiply deformed. Faults are common and most folds have steep axial planes. Flowage of the carbonates under tectonic stress is more common and obvious than to the south. Bedding surfaces (along which solution can occur) generally are contorted and no longer planar. Contacts with phyllitic layers and with quartzite generally are quite sharp and may exhibit shearing that resulted from differences in competency. Throughout both the inner Piedmont and the carbonate regions, tectonic transport largely has been to the northwest, although southeast overturning in the extreme eastern part of the inner Piedmont is notable.

The Triassic rocks have been tilted rather uniformly to the northwest and intruded by diabase. In some places they are faulted as well as gently folded. However, the rocks are not regionally metamorphosed so that primary features such as cross-bedding and dinosaur footprints are evident. The north margin contact with other rock units is sharp and in many places is the locus of a fault or fault zone. This basin generally is considered to represent a half-graben with the major faulting along the north margin.

The Precambrian rocks of the Reading Prong and South Mountain are believed to have been emplaced by thrust faulting, the final deformation being of Alleghanian (late Paleozoic) age. Earlier deformations and metamorphisms in the Reading Prong from the Taconic (middle Ordovician) and Acadian (Devonian) orogenies have been interpreted from radiometric analyses and from the patterns of deformation. Such older events are not well substantiated at the northern end of the Blue Ridge in South Mountain. The younger deformation, one that altered the Triassic rocks, had only a minor effect on the rocks of both provinces.

The original clastic and extrusive rocks of the inner Piedmont, the Reading Prong, and the Blue Ridge (later intruded by igneous rocks and metamorphosed) all are characteristic of sedimentation associated with island-arc volcanism that lay to the southeast. This eugeosyncline and its accompanying miogeosyncline of carbonate sedimentation extended the length of the present Appalachians. In terms of time, this geosyncline existed from the Precambrian through the Paleozoic era. The Ordovician (Taconic) and the Triassic (and perhaps also the Alleghanian) orogenies may have resulted from the closing and opening of the Atlantic Ocean, and hence may be related to plate tectonics of the crust as it moved relative to the underlying mantle. Intrusion of mantle material as ultramafic to granitic and diabasic igneous rocks occurred at these times. Extreme metamorphism during later Precambrian and early Paleozoic time yielded granites and pegmatites very similar to true igneous rocks. Lower grade, regional metamorphism and tectonic deformation in southeastern Pennsylvania have accompanied all the major orogenies.

CAVE FORMATION

Because uplift and erosion accompanied all the major orogenies, the processes of tectonic deformation and erosion have modified all the lithologies through Triassic time. Since the Triassic, glacial meltwater, outflow, and surficial erosion have dominated the alteration of the crustal surface. These processes, each with distinctive geologic characteristics, have led to the formation of the present variety of caves. Paleozoic processes were responsible for the geologic setting in which present day caves formed or are forming, but apparently little actual cave development took place before late Pliocene or early Pleistocene time.

The environments of formation of caves in southeastern Pennsylvania (Table 1) can be grouped into three dominant categories: 1) in carbonate lithologies, 2) as diabase boulder caves, and 3) associated with tectonic features. Caves occurring in carbonate rocks are by far the most common type found in southeastern Pennsylvania. Caves are found in the limestones of the Beekmantown Group (Mt. Joy Caves), Tomstown Formation (Durham Caves), Conestoga Formation (Gable Cave) and Conococheague Group (Kurtz Quarry Caves). They also occur in the dolomites of the Ledger Formation (Billmyer East Cave) and Vintage Formation (Donnerville Cave). Caves occurring in carbonate rocks form along lithological contacts and structural features such as bedding planes, joints, faults or cleavages. All are the result of dissolution of carbonate bedrock by movings groundwater.

The extensive development of caves in the carbonates of the study area is primarily a function of the high solubility of limestone in percolating

surface and ground waters. Although calcium carbonate, the major constituent of limestone, is only slightly soluble in pure water, it is more soluble in groundwater, which usually contains dissolved carbon dioxide from the atmosphere and from organic matter in the soil, and undergoes the conversion into calcium bicarbonate as shown below.

$$\underset{\text{Calcium Carbonate}}{CaCO_3} + \underset{\text{Carbon Dioxide}}{CO_2} + \underset{\text{Water}}{H_2O} = \underset{\text{Calcium Bicarbonate}}{Ca(HCO_3)_2}$$

The most extensive caves occur in regions of relatively pure limestone, i.e. non-dolomitic rocks, although ten caves are found within the dolomites of the Ledger and Vintage Formations in Lancaster County (see Table 2). Underground drainage is generally excessive and surface drainage lacking in regions of limestone or karst topography. Caves in carbonate rocks result from the dissolution of carbonate bedrock by groundwater moving along lithological contacts and structural features such as bedding planes, joints, cleavage planes, or faults. Cave passageways may be further eroded or filled in by large amounts of silt and insolubles from the carbonate rock transported by groundwater.

Surface features in limestone regions are often quite distinctive, resulting in a type of topography identified as karst topography after the Karst region of the Adriatic. Moderate rainfall in the eastern part of the United States contributed to significant karst development in the Great Valley physiographic province of Pennsylvania. Sinkholes, also called dolines, are the most common topographic form in the karst terrains of humid temperate climate regions. A sinkhole is a usually circular depression, varying in depth from one to 100 feet and ranging in area from a few square feet to several acres. They are developed slowly by downward solution of carbonate bedrock beneath the soil mantle or by collapse of roof rock above an underground solutional void or cave. Surface waters may fill sinkholes, forming sinkhole ponds or karst lakes, or be drained through swallow holes, surface openings within sinkholes. Fluted, solution ridges and furrows (lapies and grikes) are also common in karst terrain. "Sinking" or "hidden" springs which terminate in or emerge from sinkholes also denote karst topography in limestone regions.

Boulder caves such as Devils Den Cave in Adams County and Mt. Hope Boulder Caves in Lancaster County are formed by the erosion of large blocks, principally diabase, with block slumping and the subaerial removal of the fine-grained material. Caves and rock shelters related to tectonic features, such as Wind Cave in Lancaster County, are the result of weathering, water erosion and slumping (or "caving") along planes of weakness such as along the contact between different rock types, at fault

or shear sites, and along fold axes. They are the least common of the three types of caves found in southeastern Pennsylvania in non-carbonate rocks, and are not the result of the chemical dissolution of the rock but of the relative resistance to weathering and erosion.

Processes of chemical dissolution are the principal modes of cave formation. Most caves resulted from the rather recent solution action of percolating surface and groundwaters, by freezing and thawing (wedging), and by rock slumping associated with water erosion. However, there have been many times in the geologic history of southeastern Pennsylvania when the surface (at that time) was subjected to erosion as seen in rock unconformities and as seen in sediments derived from a land source to the southeast. Thus, paleo-erosion has occurred and caves may have formed in previous geologic periods. Tectonic caves could have also formed at this time. The most important periods of erosion probably occurred just after intervals of mountain building. These intervals are called (from oldest to youngest) the Taconic in mid-Ordovician, the Acadian from Devonian into Mississippian, the Alleghanian from Pennsylvanian into Permian and the Triassic. More recent, lesser deformations followed.

TABLE 1. *Locations of Southeastern Pennsylvania Caves*

Name	Quadrangle	Latitude	Longitude	Elev.
ADAMS CO.				
Devil's Den Cave				
BUCKS CO.				
Dean Cave	Doylestown	40–26	75–05	
Durham Cave No. 1	Riegelsville	40–35–08	75–12–03	
Durham Cave No. 2	Riegelsville	40–35–09	75–12–03	
CHESTER CO.				
Bazaillion's Cave				
Paula's Pit	Valley Forge	40–04–45	75–25–10	170
DELAWARE CO.				
Castle Rock Cave	Lansdowne	39–59	75–22	
LANCASTER CO.				
Abe Buzzard's Cave	New Holland	40–04–15	76–02–42	800
Billmyer East Cave	York Haven	40–04–23	76–38–49	320
Cassell's Cave	Manheim	40–09–05	76–23–44	420
Chickies Rock Retreat	Columbia West	40–03–08	76–31–32	255
County Home Cave	Lancaster	40–02–15	76–17–05	300

TABLE 1. *Locations of Southeastern Pennsylvania Caves*—Continued

Name	Quadrangle	Latitude	Longitude	Elev.
Danville Pike Cave	Lancaster	40–00–50	76–18–22	260
Devil's Hole Boulder Caves	Morgantown	40–11–48	75–59–30	580
Donegal Cave	Columbia West	40–05–10	76–32–17	320
Donnerville Cave	Columbia East	40–02–18	76–24–28	410
Erb's Mill Shelters	Holtwood	39–51–50	76–20–17	500
Fallen Rock Shelter	Holtwood	39–49–32	76–17–48	350
Gable Cave	Lancaster	40–00–39	76–19–37	280
Garber Cave	Elizabethtown	40–07–33	76–30–18	340
Gehman Cave	Ephrata	40–13–11	76–11–13	380
Governor's Stables	Middletown	40–07–33	76–41–29	480
Hess Shelter Cave	Conestoga	39–59–56	76–18–50	280
Horst Cave	Ephrata	40–13–03	76–11–13	380
Kinzers Cave	Gap	39–59–58	76–04–20	430
Kurtz Quarry Cave	Ephrata	40–10–25	76–11–46	310
Lampeter Cave No. 1	Lancaster	40–00–01	76–16–02	300
Landis Quarry Cave	Columbia West	40–06–44	76–35–00	310
Leaman Cave	Quarryville	39–55–35	76–11–41	420
Lititz Springs Cave	Lititz	40–09–25	76–18–44	370
Martin Cave	Ephrata	40–11–52	76–14–25	320
Metzger's Indian Cave	Columbia East	40–07–19	76–24–59	355
Middle Creek Cave	Ephrata	40–10–07	76–14–32	320
Mount Hope Boulder Caves	Manheim	40–14–16	76–25–52	660
Mount Joy Cave No. 1	Columbia West	40–07–03	76–30–12	330
Mount Joy Cave No. 2	Columbia West	40–07–03	76–30–09	315
Mount Joy Cave Nos. 3 & 4	Columbia West	40–07–06	76–30–01	330
Mount Joy Cave No. 5	Columbia East	40–07–06	76–29–59	340
Mount Pleasant Cave	Elizabethtown	40–08–25	76–30–30	350
Mummau Caves	Elizabethtown	40–08–42	76–31–56	410
Nissley Cave	Safe Harbor	39–58–30	76–26–53	340
Peck's Cave	Columbia West	40–04–42	76–35–03	390
Pequea Church Caves	Honeybrook	40–03–12	75–59–33	
Phil's Cave	Columbia West	40–04–20	76–35–40	360
Red Hill Cave	York Haven	40–05–40	76–39–29	325
Refton Cave	Quarryville	39–57–03	76–14–50	320
Reynolds Cave	Kirkwood			
Rineer Cave	Quarryville	39–59–29	76–12–09	460
St. Mary's Church Cave	Conestoga	39–56–34	76–22–25	280
Seibel Cave	Elizabethtown	40–07–58	76–30–08	330
Sheep Rock Shelter	Safe Harbor	39–57–42	76–26–21	450
Silver Hill Boulder Cave	Morgantown	40–11–14	75–58–27	740
Snyder Caves	Terre Hill	40–09–27	76–06–35	340
Stackstown Cave	York Haven	40–05–35	76–38–39	320
Strasburg Cave	Quarryville	39–59–30	76–11–19	380
Utility Cave	Lancaster	40–01–12	76–18–24	280
Wind Cave	Holtwood	39–52–27	76–22–16	460
Wolf Rock Cave	Gap	39–58	76–05	
Wyeth Cave	Columbia West	40–03–32	76–33–46	310

TABLE 1. *Locations of Southeastern Pennsylvania Caves*—Continued

Name	Quadrangle	Latitude	Longitude	Elev.
MONTGOMERY CO.				
Conshohocken Cave				
Port Kennedy Cave No. 1	Norristown	40–07	75–27	
Port Kennedy Cave No. 2				
Port Kennedy Cave No. 3				
Schuylkill Cave	Norristown	40–02–54	75–15–43	
Swedeland Cave	Norristown	40–04–55	75–20–07	
Valley Forge Caves	Valley Forge	40–05–46	75–26–18	
PHILADELPHIA CO.				
Cave of the Wissahickon				
Gorgas Lane Cave				
Miquon Caves				
Strawberry Mansion Cave				
YORK CO.				
Bootlegger Sink	York Haven	40–00–54	76–43–15	380
Colmoru Cave	West York	39–57–17	76–47–48	400
Conglomerate Cave	Dillsburg	40–06–50	77–03–28	598
Crystal Pit	Safe Harbor	39–54–30	76–29–55	260
Devil's Hole	Red Lion	39–56–47	76–34–49	660
East York Cave	York	39–57–31	76–42–15	460
Emig Cave	York Haven	40–01–13	76–43–27	380
Lisburn Cave	Lemoyne	40–10–20	76–54–15	
Marble Cave	West York	39–58–04	76–45–30	420
North York Cave	York	39–59–56	76–44–51	440
Pigeon Cave	West York	39–58–04	76–45–15	360
Railroad Rock House	Glen Rock	39–46–30	76–43–10	
Sandy Cave	West York	39–58–14	76–45–16	380
St. Mark's Cave	York			
Taxville Quarry Caves	West York	39–57–17	76–47–48	400
Thomasville Quarry Cave	West York	39–55–36	76–51–13	410
West York Cave	West York	39–58–02	76–45–14	380
Williams Grove Caves	Mechanicsburg	40–08–35	77–01–50	450
Willis Run Pit	West York	39–58–14	76–45–16	375
Yellow Breeches Caves	Lemoyne	40–11–15	76–54–50	

ADAMS COUNTY

DEVILS DEN CAVE

Devils Den Cave (Figure 2) is located in the southwest corner of Devils Den in Gettysburg National Military Park. From Entrance 2 a stoopway leads in 18 feet to a widening and then turns left for an additional 20 feet. Here there is an exit at the bottom of a crevice. By turning

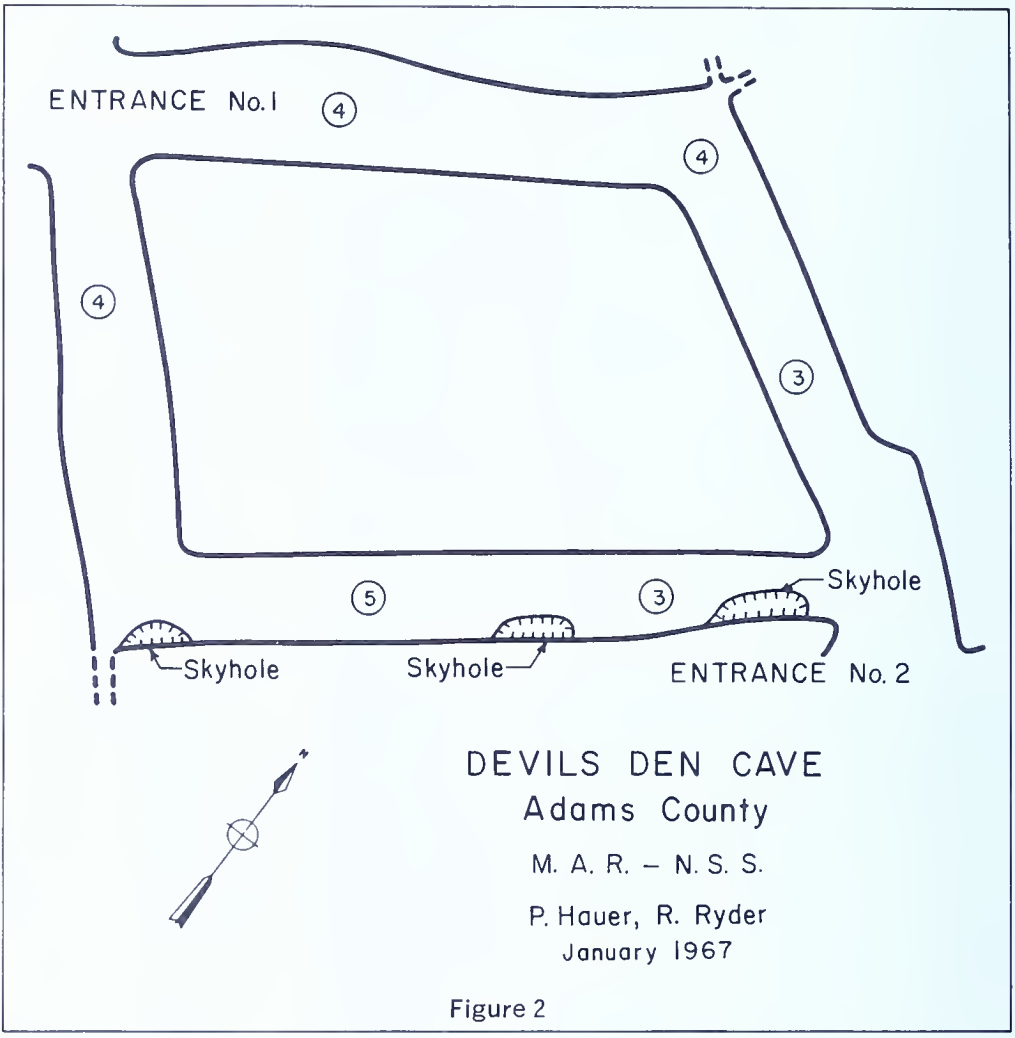


Figure 2

left at the beginning of the second entrance, another passage extending 25 feet is encountered. It exhibits several small, impassable skyholes to the outside. At 25 feet there is a right turn continuing 18.5 feet and emerging next to Entrance 1.

Devils Den is part of the Triassic diabase dike which intruded Gettysburg sandstone and shale 180 million years ago. The den is composed of boulders which have been formed by exfoliation of the diabase bedrock. The cave is a boulder cave resulting from the space left at the bases of adjacent rounded boulders. The caves and crevices of the Den are inhabited, in summer, by numerous copperhead snakes. These openings played an important part in the Battle of Gettysburg, when on July 2, 1863, Confederate sharpshooters hiding there picked off numerous Union soldiers on nearby Little Round Top hill.

Peter M. Hauer

BUCKS COUNTY

DEAN CAVE

On the topographic map of the Doylestown Quadrangle, in Plainfield Township, two miles northwest of Point Pleasant, appears the name Dean Cave. The location is in the loop of Tohickon Creek where the Lockatong Formation of Triassic age is exposed. Dean B. McLaughlin of the University of Michigan, and Bradford Willard of Lehigh University, both of whom have studied the geology of the vicinity, say there is no cave, only a rockhouse or shelter under an overhanging rock.

Reference: 22

DURHAM CAVE NO. 1

Durham Cave No. 1 (Figure 3) is located in the triangle formed by U.S. Route 611 and Pa. Route 212, 9.6 miles south of the Lehigh Valley Railroad Bridge in Easton. One can best get to it by walking down a gully that leads from Ewald's Diner on U.S. Route 611 to the cave. The cave, which is in limestone of the Tomstown Formation dipping about 29° to the northwest, is truly impressive. It consists primarily of a large room about 160 feet long, 55 feet wide, and 30 feet high at the center. This immense room was at one time larger, and reportedly but one of three rooms. The first two rooms and much of the third have been unfortunately quarried away.

In the left wall of the remaining room are two short passages. One of them, high on the wall near the entrance, is extremely difficult to reach. This passage pinches out; cold air, however, flows from it, and it may be an impassable connection with Durham Cave No. 2. The other passage, at ground level, ends in a mud plug.

Durham Cave has received much attention in the past because of the discovery of Pleistocene bones there. A collection of bones was first made in this cave about 1865 by H. D. Rogers, State Geologist. Then in 1893 Dr. Henry C. Mercer of the University of Pennsylvania began an intensive investigation of the cave's bones. A display of many of these may be seen in the Bucks County Historical Society Museum in Doylestown, Pennsylvania.

B. Nagy

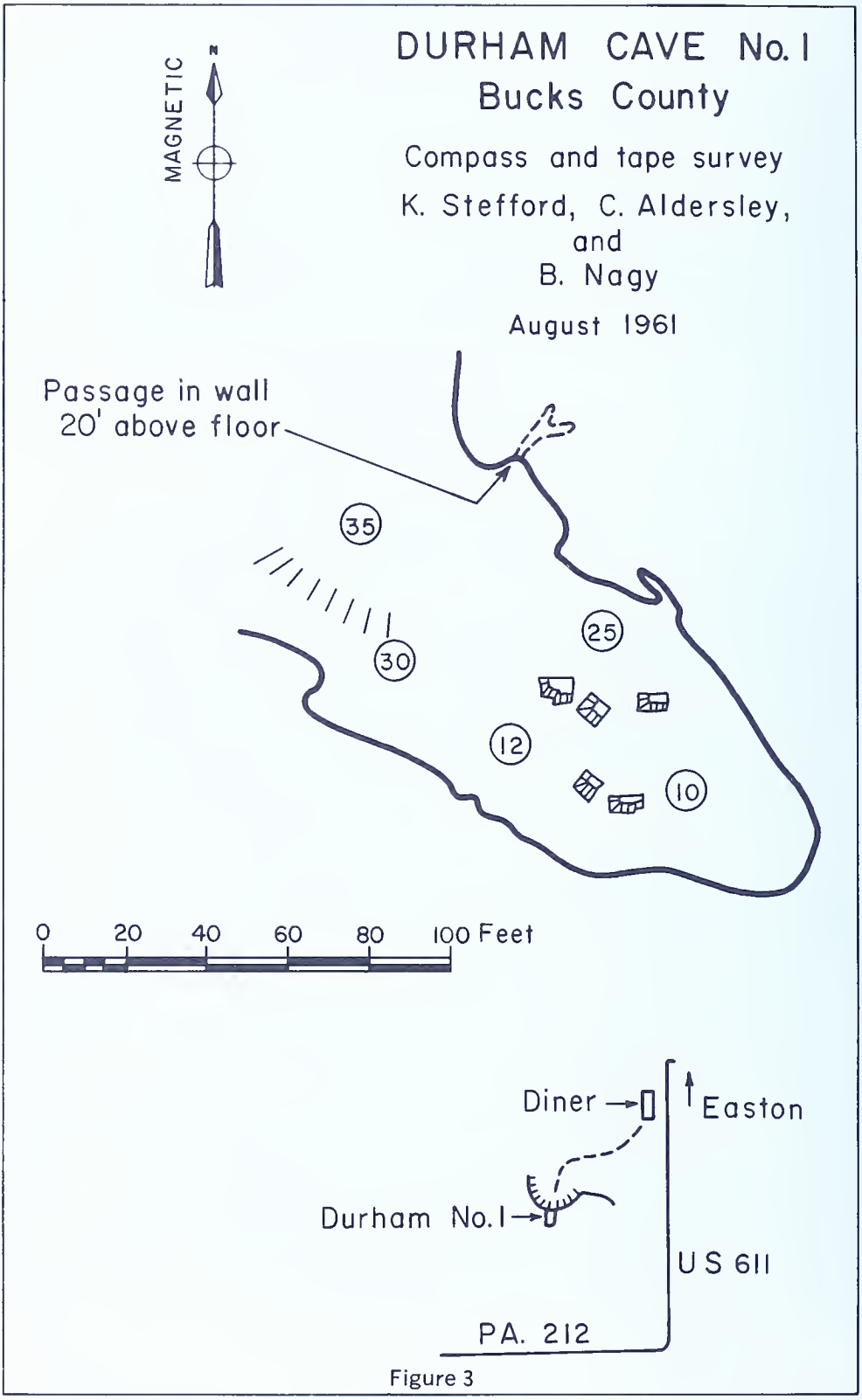

DURHAM CAVE No. I
Bucks County
Compass and tape survey
K. Stefford, C. Aldersley,
and
B. Nagy
August 1961
MAGNETIC
N
Passage in wall
20' above floor
35
30
25
12
10
0 20 40 60 80 100 Feet
Diner
Easton
Durham No. I
US 611
PA. 212

Figure 3

DURHAM CAVE NO. 2

From the entrance of Durham Cave No. 1 a path leads about 125 feet in a northwesterly direction up a precipitous slope to Durham Cave No. 2 (Figure 4). The entrance to Durham No. 2 is a pit in mud about 12 feet deep and about 4 feet across. The pit can be climbed easily.

Once in the cave a turn to the left leads down a 45° slope about 40 feet. A small hole on the right leads into the Pretty Room, where some dark brown speleothems can be found. These mineral deposits should not be disturbed. This is the only part of the cave that is substantially wet. Most of the rest of the cave is extremely dry and dusty. From the Pretty Room a tight circuit to the left can be made, bringing one back to the entrance of the room. About halfway up the slope toward the entrance a fairly large passage leads to the right. This passage, called the Bone Passage because bones of an opossum and a raccoon were found here, leads about 25 feet to a second entrance to the cave and to a 10 foot drop leading downward into the Waiting Room. At the left side of this room is another entrance to the cave. At the base of the room is a small hole leading down into the lower level of the cave through the pile of breakdown which composes the floor. Beneath the hole the main passage continues about 25 feet at an angle of 54° under a large hanging rock to a point where the passage splits. The left hand passage goes downward about 20 feet at a 33° angle; the right hand passage goes downward about 50 feet at approximately the same angle. Near the Hanging Rock, a tight passage leads down to the left through breakdown to the point where the main passage splits.

Breakdown of all sizes and shapes composes the walls, floors, and even occasionally the ceiling of many parts of this cave. One should be extremely careful not to dislodge any rocks, especially when negotiating the drops at the Waiting Room. Though Durham No. 2 is structurally relatively safe, the danger of falling rock makes the wearing of a hard hat an absolute necessity.

B. Nagy

CHESTER COUNTY

BAZAILLION'S CAVE

"On a map of Vincent Township made in 1773, one of the landmarks noted is 'Bazaillion's Cave' (named for Peter Bazaillion) which is located near the river, opposite the lower end of the island near Spring City."

"River" here probably means the Schuylkill near its confluence with French Creek.

David N. Brison

Reference: 11

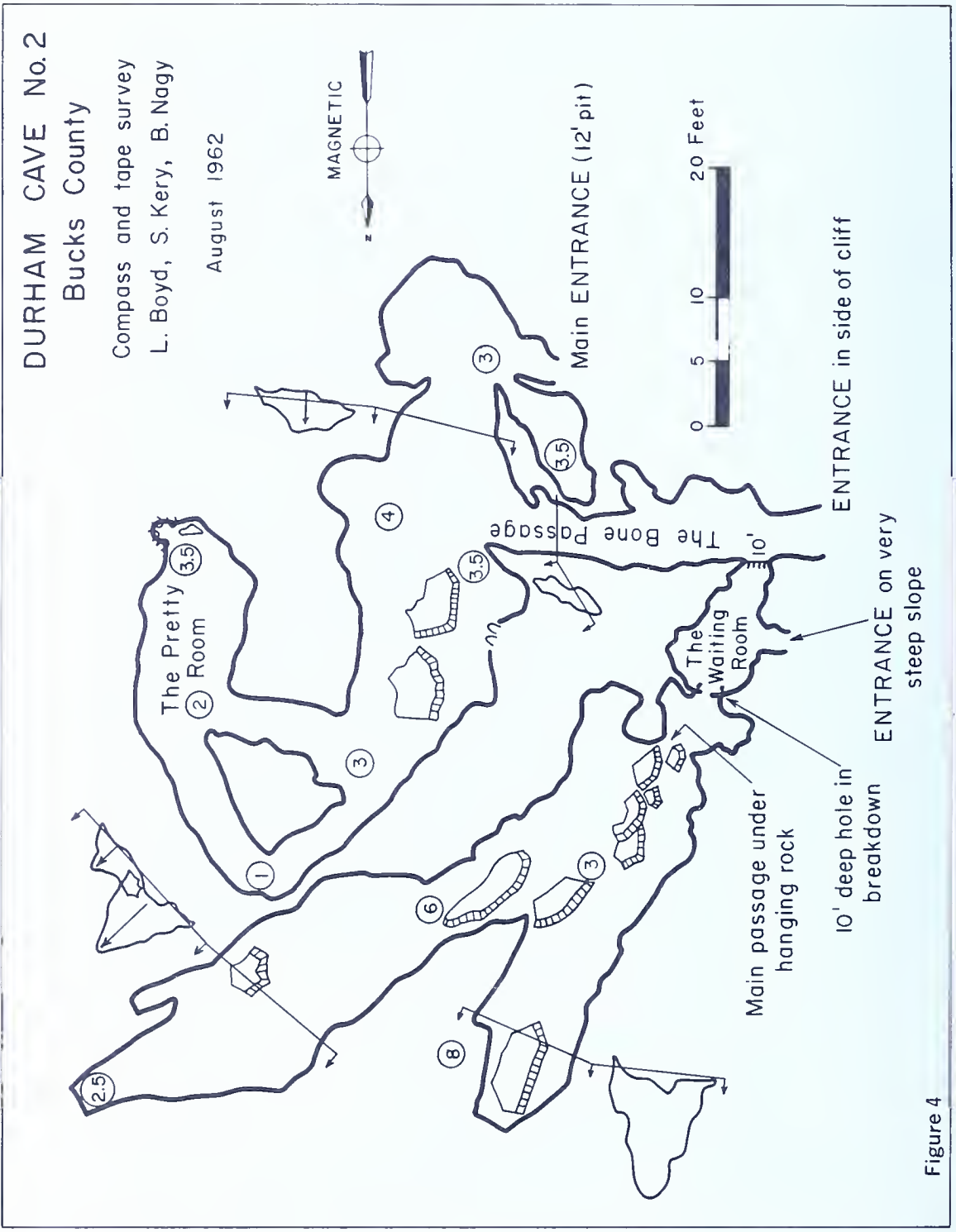

DURHAM CAVE No. 2
Bucks County
Compass and tape survey
L. Boyd, S. Kery, B. Nagy
August 1962
MAGNETIC
N
0 5 10 20 Feet
Main ENTRANCE (12' pit)
ENTRANCE in side of cliff
The Bone Passage
The Pretty Room
The Waiting Room
Main passage under hanging rock
10' deep hole in breakdown
ENTRANCE on very steep slope
10'
2.5
3.5
3.5
3.5
1
2
3
3
3
4
6
8

Figure 4

PAULA'S PIT

The cave is 1.4 miles west of the Valley Forge exit of the Pennsylvania Turnpike at an elevation of 170 feet.

The entrance is a pit six feet deep at the base of a sink 30 feet in diameter and 20 feet deep. The cave consists of two rooms, one below the other. The upper room is six feet high and 15 feet across. In the floor of the room is a narrow opening 10 feet deep. Below this is a dirt slope and another room the same size as the upper one. A one foot high passage goes east from this for 10 feet and is then choked with mud. The passage to the lower room was dug open in 1965. In wet weather, a stream flows into the sink, carrying with it much mud. In the summer of 1966, the hole to the lower room was completely buried by mud. The total depth of the cave from the base of the sink is about 30 feet.

DELAWARE COUNTY

CASTLE ROCK

James Fitzpatrick, a Revolutionary Army deserter known as Sandy Flash, who was hanged in Philadelphia in 1778, is said to have used Castle Rock Cave as a hideout. It was 2 miles west of Newton Square on the West Chester Pike. Charles H. Zensen, reported in October 1951 that the company operating the trolley line from Upper Darby to West Chester purchased the land including the cave. The rock was quarried for ballast on the roadbed and thus the cave was lost. Probably this was not a true cave but a shelter under huge blocks of the local gabbro or gneiss.

Reference: 22

TABLE 2. *Caves Found In Lancaster County Carbonate Rocks*

BEEKMANTOWN GROUP

15 caves
mean length — 94 feet
longest cave — Mummau Cave No. 1 (600 feet)

caves:

Cassell's *	Mount Joy (5)
Garber *	Mount Pleasant
Gehman	Mummau (2)
Horst	Seibel
Landis Quarry	Snyder *

TABLE 2. *Caves Found In Lancaster County Carbonate Rocks*—Continued

VINTAGE FORMATION

6 caves
mean length — 88 feet
longest cave — Rineer Cave (220 feet)

caves:

Donnerville
Kinzers
Refton
Rineer
Strasburg
Wyeth

LEDGER FORMATION

4 caves
mean length — 88 feet
longest cave — Pequea Church Cave No. 1 (180 feet)

caves:

Billmyer East*
Pequea Church (3)

NEW OXFORD FORMATION (POTOMAC MARBLE)

1 cave
mean length — 60 feet

cave:

Red Hill

CONESTOGA FORMATION

10 caves
mean length — 38 feet
longest cave — Gable Cave (130 feet)

caves:

County Home*
Danville Pike*
Gable
Hess Shelter
Lampeter (2)
Leaman
Nissley
St. Mary's Church
Utility

CONOCOCHEAGUE GROUP

12 caves
mean length — 34 feet
longest cave — Kurtz Quarry Cave No. 1 (120 feet)

caves:

Donegal*
Kurtz Quarry (2)
Lititz Springs (4)
Martin
Middle Creek
Peck's*
Phil's
Stackstown*

* indicates unsurveyed caves

LANCASTER COUNTY

ABE BUZZARD'S CAVE

A now-destroyed shelter cave at the "Blue Rocks" in East Earl township is reputed to have been one of the temporary hideouts of the notorious Abe Buzzard. Toward the end of the last century, Buzzard and his gang roamed the Welsh Mountain area and gained a reputation for stealing anything from chickens to household goods.

The "Blue Rocks", located 1.25 miles west of Mount Airy and just north of the powerline, are an extensive outcrop of quartzite of the Chickies Formation at the Western extremity of the Welsh Mountain ridge. Some local residents recall that the roof of the cave consisted of a large overhanging boulder which has since collapsed.

There is a small, well-concealed cave at the west end of the outcrop. This is merely a fourteen-foot-long crawlway totally unsuitable for habitation.

David N. Brison

BILLMYER EAST CAVE

The cave consists of a mere crawlway, 15 feet long, which developed in the upper beds of dolomite of the Ledger Formation. It was revealed by the stripping of overburden in the J. E. Baker and Co. quarries at Billmyer.

The cave can be found 0.25 mile east of the railroad grade crossing at Billmyer and 200 feet northwest of the dirt access road to Billmyer. Permission to enter the quarry should be obtained from William Rhoads in Bainbridge.

Large milky calcite crystals and clear crystals of dolomite were collected outside the entrance to the cave. Two hundred feet to the south, a typical karst landscape consisting of lapies and grikes was exposed by the stripping operation.

David N. Brison

CASSELL'S CAVE

A formerly large cave, now destroyed by quarrying, was situated in a limestone quarry near the Chickies Creek, 0.5 mile southwest of Manheim. Two small solution pockets are all that remain of what was the large entrance chamber. Any passages possibly leading on to more cave are covered with broken stone and debris. The limestone of the Beekmantown Group dips here gently to the south.

J. R. Reich, Jr.

CHICKIES ROCK RETREAT

Chickies Rock is a prominent outcrop of Cambrian quartzite between Marietta and Columbia. The broad anticline of Chestnut Ridge is cut here by the Susquehanna River to form the high promontory of Chickies Rock. A wide arched-roof shelter at the base of the Rock is formed along the axis of the anticline.

Prof. S. S. Haldeman, the eminent 19th Century scientist and philosopher of Marietta, conducted an excavation at this shelter and recovered many artifacts of Indian manufacture. These artifacts are now in the collections of the University of Pennsylvania Museum in Philadelphia and can be viewed there.

J. R. Reich, Jr.

Reference: 10

CLIMBER'S RUN SHELTER CAVE(S)

A cave or caves reported by Dennis McGill of Lancaster could not be located for inclusion in this report.

J. R. Reich, Jr.

COUNTY HOME CAVE

Directly behind the Lancaster County Home, 900 East King Street Lancaster, and along the Conestoga Creek is a quarry in steeply dipping limestone beds of the Conestoga Formation. A cave on the quarry wall closes at the inner end such that a man can advance no farther.

J. R. Reich, Jr.

DANVILLE PIKE CAVE AND SOLUTION POCKET

One and one-half miles south of Penn Square in Lancaster, at the intersection of Second Lock Road and Pa. Route 324 (the Danville Pike) is a small cave in an outcrop of Conestoga limestone. The cave is simply a crawlway ten feet long. A small stream of water flows from the cave occasionally.

A small solution pocket occurs in the Conestoga Formation limestone 0.1 mile south of the cave.

J. R. Reich, Jr.

DEVIL'S HOLE BOULDER CAVES

Devil's Hole Boulder Caves are owned by Fred Adams and Norman Weber, Oak Creek Reservation, Box 128, Bowmansville, Pennsylvania

These boulder caves are in a wooded, hilly region, 1.6 miles east of Bowmansville, Brecknock Township. Drive east, out of Bowmansville, for 1.7 miles to the Oak Creek Camping and Trailer Reservation. Stop at the office here to ask permission and obtain more specific directions.

The boulder caves are at an altitude of 580 feet. They may be reached from the south edge of the camp by crossing Oak Creek and following the ascending trail southwest for about 1300 feet. Here one encounters a large boulder-strewn slope and it is among these boulders that the caves are found.

The earliest known description of these boulder caves was written in 1881 by John Good. He called this collection of boulders "Devils Cave," but made no mention of anything of historical interest.

A guide to the Bowmansville area, edited by Charles Waters in 1940, relates several legends and highly fantastic tales about outlaws, thieves, and Civil War deserters who, at one time or another, found refuge in these caves. It is not the purpose of this report to deal with matters of historical accuracy. Suffice it to say that most of these tales are probably fabrications of an imaginative modern mind. Even though the Devil's Hole Boulder Caves are quite extensive laterally, nevertheless, the spaces beneath the boulders are too low and confined to provide a decent habitation.

The Devil's Hole Boulder Caves together constitute the most extensive known system of diabase boulder caves in Lancaster County and perhaps in the entire state. The combined passage length of two boulder caves here is over 210 feet. These two caves have not as yet been physically connected but they approach within 20 feet of each other and the same stream flows through both of them.

Boulder Cave No. 1—This cave is located at the northwest edge of the boulder slope. Painted letters over its main entrance specify it as "The Den". The total passage length here is 36 feet, making it one of the smaller boulder caves in the area. The small stream which flows among its boulders is independent from the one which flows through the two larger caves, but both streams join further down the slope.

Boulder Cave No. 2—About 130 feet southeast of the first cave and near the base of an isolated tree is the main entrance to the largest boulder cave. There are actually several ways of getting down into this cave through the boulders but most of them are rather tight and tortuous.

At the main entrance one must duck under a large diabase boulder and then drop down 8 feet. Here a crawl can be followed north for 8 feet to a keyhole. On the other side of this keyhole there is a low room and a segment of the stream is visible. From this point one can crawl upstream in a southerly direction for roughly 50 feet or downstream in a

northerly direction for almost an equal distance. The total known passage in this boulder cave in 160 feet.

Nearly all the passages are in complete darkness and have from 8 to 10 feet of bounder cover. The heigth and width of the passages ranges from 2 to 6 feet. The small stream seeks the most direct route, flowing mainly through impassable cracks between the bounders. Short segments of the stream appear in various parts of the low, twisting passageways.

Boulder Cave No. 3—Near the base of the boulder slope, approximately 120 feet north of the main entrance to Boulder Cave 2, there is a third cave. Three or more tight openings among the boulders allow one to enter this cave and reach the lower part of the same stream which travels through the second cave. With difficulty one can proceed south, following upstream, for 40 feet. Here, at a point estimated to be 20 feet downstream from the northernmost sections of Boulder Cave No. 2, the spaces between the boulders become too restricted. So far no way has been found to traverse this intervening area and link up the two caves.

A broad intrusive sheet of Triassic diabase outcrops in an irregular band along the northeastern boundary of Brecknock Township. The Devil's Hole and Silver Hill Boulder Caves, slightly over 1 mile apart, occur at the eastern edge of this diabase band. All of these boulder caves were formed by similar geologic processes.

Initially, the intruded mass of diabase, consisting primarily of feldspar and augite, cooled and fractured into several smaller masses. These separate masses were later modified and rounded by the process of exfoliation, a weathering action which is still going on.

Exfoliation takes place when homogeneous rock masses spall off in rounded slabs or flakes, similar to the peeling of onion layers. This could be caused by: "a. seasonal changes of temperature causing an expansion and contraction of the rock sufficient to bring about a peeling of the surface; and/or b. expansion of the surface due to hydration of the feldspars. . . This process of exfoliation is aided by other destructive agencies. The microscopic crevices first opened up by temperature strains furnish access for waters, gases, and perhaps minute plants." (Lobeck, A., 1939)

The continued reshaping of the diabase masses reduced their original size and caused then to slowly shift and regroup. In this way, spaces were created between the various rounded masses. These cavities were further enlarged due to boulder displacement resulting from Post-Triassic faulting and also through the removal of weathering debris by the streams which found a course among the boulders.

David N. Brison

References: 8, 15, 24

DONEGAL CAVE

Many hard-water springs emerge from the limestones of the Conococheague and Beekmantown Groups along the Donegal Creek between Marietta and Mount Joy. The main source of Donegal Creek is Donegal Springs, having an output of nearly four million gallons of water daily. Another tributary spring can be traced to where it emerges from Donegal Cave in the Conococheague limestone. The cave's entrance is 4 feet high and 2 feet wide. Ten feet inside the cave the spring issues from 2 small fissures and quietly flows along a gravel floor.

J. R. Reich, Jr.

DONNERVILLE CAVE

A small cave, owned by Elmer Shirk, R. D. 1, Manheim, Pa., can be found by traveling one mile east from Mountville on U. S. Route 30, the Lincoln Highway. At this point, turn north onto Donnerville Road. A short macadam lane on the east side of the road leads to a farm occupied by Harvey Seibel, R. D. 2, Columbia, and a small trash-filled quarry.

The entrance to Donnerville Cave (Figure 5), on the south quarry wall, is six feet high and three feet wide. A drop at the entrance requires one to scramble upward six feet in order to enter the cave. A small chamber, ten feet high, four feet wide, and ten feet long, is encountered five feet from the entrance. A narrow crawlway continues from the chamber for about 15 feet, where a slot in the ceiling admits one to a cavity eight feet wide, six feet long and one foot high. In order to measure the terminating cavity, the author had to squirm through the above mentioned slot which is only eight inches wide.

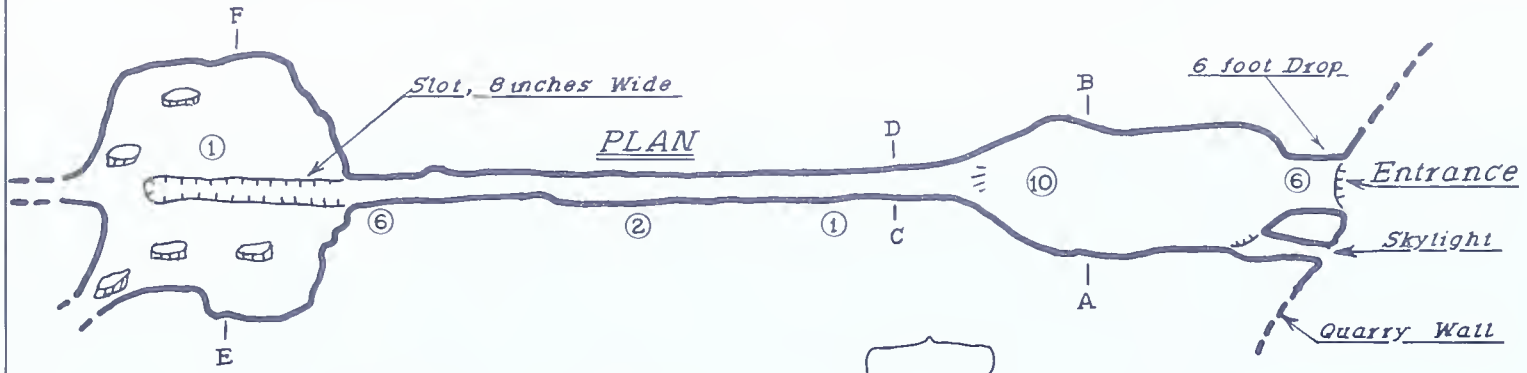
The Donnerville area is underlain by Cambrian carbonate rocks. Donnerville cave is excavated in the upper Vintage Formation, which is here massive dolomite. The cave follows a course due east along a calcite vein in the northward dipping Vintage Formation. Some varicolored quartz can be found interbedded in the calcite vein. The basal shale member of the Kinzers Formation outcrops directly above the cave.

J. R. Reich, Jr.

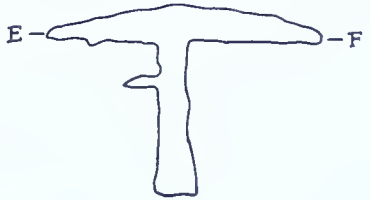
Reference: 13

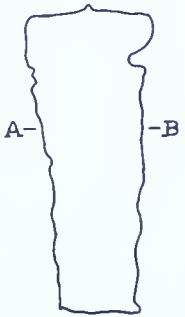
ERB'S MILL SHELTER CAVES

The large rock outcrop known as Tuquan Rock is located at Erb's Mill, two miles southeast of Pequea and three miles north of Holtwood. The Rock is a large promontory of schist which has been eroded into various weird shapes by the vadose action of a small creek.



CROSS SECTIONS





LEGEND

- Surveyed Passage
- Unsurveyed "
- (2) Ceiling Height (ft.)
- Floor Slope
- Drop or Ledge
- Large Rock

DONNERVILLE CAVE

Donnerville, Lancaster County, Penna.

July 22, 1967

SPELEO-RESEARCH ASSOCIATES

Marietta, Pennsylvania

Drawn and surveyed by

J. R. Reich, Jr.

Cave No. 1 is a chamber, open at one end, 20 feet in diameter and averaging 5 feet high. The floor is covered with a fine-grained dust, apparently derived from the schist.

Several other smaller openings occur on the outcrop, and a curious natural bridge has been eroded into the very top of Tuquan Rock.

J. R. Reich, Jr.

FALLEN ROCK SHELTER

On the south side of Muddy Run ravine, one mile northeast from where the run empties into the Susquehanna River and two miles southeast of the Holtwood Dam, there was a sizeable rock shelter developed in the Wissahickon schist. From beneath a large fallen slab which had once formed the roof of this shelter cave, several shards of Indian pottery, dating to the Middle Woodland Period (500 B.C. to 500 A.D.), were excavated by Elwood Walbert and others from the Society for Pennsylvania Archaeology (Walbert, E., report in preparation).

This shelter cave plus several others in the vicinity have all been destroyed and inundated by the Philadelphia Electric Company's hydroelectric project.

All of these rock shelters were created by stream erosion prior to down-cutting. The subsequent partial destruction of Fallen Rock Shelter was probably due to the expansive action of freezing interstitial water.

David N. Brison

GABLE CAVE (INDIAN CAVE)

Gable Cave (Plate 1), owned by Lewis Mortensen, R. D. 6, Lancaster, Pa., is on Conestoga Creek 1.5 miles east of Millersville and two miles southwest of Penn Square in Lancaster. The cave can be reached by traveling on Wabank Road to the quarry on the Conestoga Creek. A 1500 foot hike on a well-worn path leading southward from the quarry office brings one to the foot of a steep hill. The cave is near the top of the hill, almost 50 feet above Conestoga Creek.

Conestoga Creek has entrenched itself here quite deeply in the limestone plateau, forming high cliffs along the shoreline. The entrance to Gable Cave is found high on one such cliff. The entrance is 10 feet high, 6 feet wide, and gently sloping inward. Ten feet inside, the roof drops abruptly to a height of two feet, but the width of the passage becomes 12 feet. Forty feet from the entrance, one encounters a small chamber 15 feet wide and up to 5 feet high. Two crawlways, each two to three

feet in height, exit eastward from this chamber. They reunite, in 20 feet, in another chamber 10 feet wide and 8 feet high. A narrow crevice leads upward 17 feet from the roof of the inner chamber.

Gable Cave is developed in the limestones of the Conestoga Formation. The entrance to the cave appears to be at the apex of a small anticlinal fold and the corridors of the cave appear to follow the axis of the fold. Extreme close folding of the limestone was noted on the west wall of the second chamber and on several rock outcrops near the entrance. Close folding is one of the prominent characteristics of the Conestoga limestone and is very well illustrated in this cave high above Conestoga Creek.

J. R. Reich, Jr.

References: 21, 22

GARBER CAVE

One mile north of Mount Joy and along a dirt road, one can find a small cave at the base of a large outcrop of limestone of the Beekmantown Group. An extremely narrow entrance leads to about 20 feet of small passageways.

The cave was once the source of a small stream which flowed from the cave's mouth to the nearby Chickies Creek. The water has apparently found another subterranean route for no water has issued from the cave in a number of years.

J. R. Reich, Jr.

GEHMAN CAVE

Gehman cave (Plate 2) is owned by Lester Gehman, R. D. 1, Ephrata, Pa. The Gehman farm is in West Cocalico Township, about 3 miles north of Ephrata. From U.S. Route 222 take the road to Schoeneck and follow it north for exactly 2 miles. Turn west into a gravel road and continue 200 yards to the farm house. The cave is in a small abandoned quarry just above Indian Run, 700 feet southwest of the house.

Originally discovered during minor limestone quarrying operations, the cave later became a haven for small mammals. Lester Gehman recalls setting traps at the entrance over 25 years ago. Bernard Smeltzer reported that in 1956 the cave was entirely closed by trash. (Smeltzer and Stone, 1956)

In August 1966, Mr. Gehman was still able to pinpoint the entrance area, and after several excavation trips, members of Speleo-Research Associates and York Grotto succeeded in sinking a shaft 8 feet down

through the compacted refuse against the north quarry wall. Finally, in November 1966, the entrance was uncovered and the cave reopened.

Gehman Cave is comprised of a network of low crawlways. The entrance is located at the bottom of an unstable 8 foot shaft, and consists of a low opening, one foot high and 3 feet wide. The passage beyond the entrance maintains more or less the same dimensions and slopes gradually downward to the northwest for 35 feet to a four-way intersection. Straight ahead, a low twisting passage continues roughly north for 22 feet where it crosses the middle of the largest passage in the cave. This north passage, up to three feet high and 4 to 7 feet wide bears almost east-west and is 35 feet long. A ceiling slot runs its entire length and impassable bedding-plane slots undercut portions of its walls.

At the western end of this north passage, collapsed debris partially blocks the way into a low tunnel, 4 feet wide and 24 feet long. Near the south end of this tunnel an impassable crawlway heads east for 15 feet and connects with the entrance crawlway at the above-mentioned four-way intersection. The fourth opening at this four-way junction leads to a passage 2 feet high and 4 feet wide which slopes downward to the northeast for 24 feet and ends in a mud choke. Three impassable crawlways lead off this passage: two connect with the entrance passage and the third joins the north passage.

Gehman Cave is developed in beds of the Beekmantown Group of limestones which here strike N38°W and dip 15°NE.

A few flat, spiral gastropod fossils were noticed on the ceiling of the northwest passage, but these were not closely enough identified to be able to ascertain the particular position that the cave-bearing beds occupy in the stratigraphic column of the Beekmantown Group.

Solution activity mostly took place along the strike and along joints bearing N75°E. Minor solution occurred along parallel joints bearing due north. The broad, impassable slots which can be noticed at different levels in the cave are quite characteristic and interesting. They were due to solution activity which followed the bedding plane along certain less resistant lenses within the limestone.

Horst Cave which is only 1400 feet southwest of Gehman Cave, was developed in distinctly different beds of the Beekmantown Group and its passages also show dissimilar characteristics.

David N. Brison

Reference: 20

GOVERNOR'S STABLES

Governor's Stables is owned by Allen Schearer, R. D. 1, Mount Joy, Pa. This boulder cave may be reached from Falmouth by traveling one mile

northeast on the Falmouth-Elizabethtown road. Turn south onto a dirt road and proceed 0.3 mile, then turn off to the southwest and park outside the gate. Follow the road and the trail southwest for an additional 1000 feet until it terminates at a large boulder-strewn slope. The cave is at the base of this slope, 250 feet north of Stony Run.

There are two well-substantiated legends connected with this cave. One states that sometime prior to 1800 a notorious horse thief, known as "The Governor", established his headquarters here (Beck, 1953). The other legend contends that the cave once had a famous visitor in the person of Andrew Curtin, Governor of Pennsylvania from 1861 to 1867. He and his aides reportedly stopped and took shelter here during a violent storm while traveling the Falmouth-Elizabethtown Pike on their way from Lancaster to Harrisburg.

This boulder cave is a rectangular room, 29 feet by 7 feet and up to 15 feet high, formed by two huge boulders capped by a third boulder. Additional boulders serve to partially enclose the room at either end.

It is quite apparent from the matching contours of the opposing walls that the two supporting blocks were once joined. A split in the capping block, perpendicular to the axis of the room, has formed a convenient natural chimney.

A broad intrusive sheet of Triassic diabase (commonly called ironstone) appears along the northwestern boundary of the county. At Governor's Stables large diabase masses have been displaced and grouped in such a manner as to leave a large boulder-roofed chamber. The boulders have become rounded due to the exfoliation of thin surficial layers (Stose and Jonas, 1933). The same process was operative in the formation of the famous "Devil's Den" diabase boulder cave on the Gettysburg Battlefield.

These fractured and rounded boulders are native to the region and do not in any way represent the terminal moraine deposits of a Pleistocene glacier. All glacial advances terminated many miles to the north.

David N. Brison

References: 5, 23

HESS SHELTER CAVE

Indian artifacts have been recovered from a cave two miles south of Lancaster, 0.25 mile downstream from where Pa. Route 324 (the New Danville Pike) crosses the Conestoga Creek. The cave (Figure 6) is merely a tunnel 8 feet high and wide, and 15 feet long. A small chimney at the rear of the cave leads upward for a distance of about 6 feet. The cave is

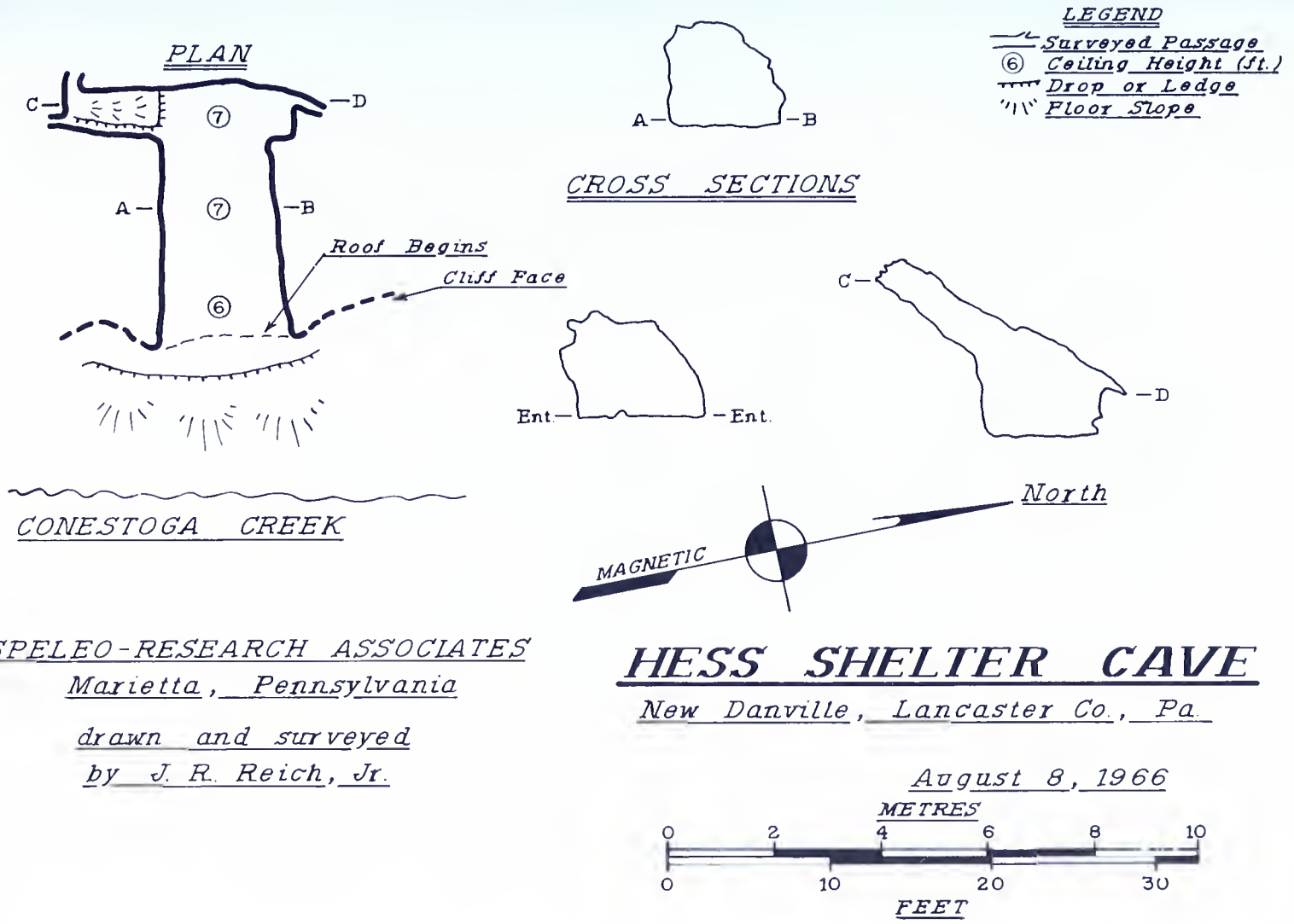

PLAN
C
D
⑦
A
B
⑦
Roof Begins
Cliff Face
⑥
CONESTOGA CREEK
A
B
CROSS SECTIONS
Ent.
Ent.
C
D
LEGEND
Surveyed Passage
⑥ Ceiling Height (ft.)
Drop or Ledge
Floor Slope
North
MAGNETIC
SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
drawn and surveyed
by J. R. Reich, Jr.
HESS SHELTER CAVE
New Danville, Lancaster Co., Pa.
August 8, 1966
METRES
0 2 4 6 8 10
0 10 20 30
FEET

Figure 6

A-12

a typical "Indian lookout" as the entrance is nearly 50 feet higher than stream level.

J. R. Reich, Jr.

HORST CAVE

On the Adam Horst farm, 3 miles north of Ephrata and 1.5 miles north of Lincoln, there is a small cave known locally as "Indian Cave". Horst Cave (Figure 7) may be reached by traveling north of Lincoln for 0.5 mile on U.S. Route 322 to the intersection with a secondary road. Turn northeast and travel 1.5 miles until a small stream, Indian Run, is approached. A short lane on the west bank of Indian Run leads north to the Horst Farm. The cave is located in a very small quarry 100 yards west of the Horst farm buildings.

A small hole, 14 by 26 inches, on the western side of the quarry leads to a steeply downward sloping passage, 3 feet wide and 2 to 4 feet high. This passage follows a course southwest and then northeast for 20 feet, to a drop of 5 feet. Below is a small chamber about 20 feet square and 5 feet high. From the chamber a crawlway leads north 15 feet to a small pool of water. Beyond the pool, a room 12 feet wide extends 35 feet in a northeast direction. This room contains extensive breakdown which divides the room into two sections and seals any hypothetical continuation of the cave. Two crawlways in the southwest corner of this room can be explored only for a short distance after which they become too small for further progress.

The area surrounding Horst Cave is dotted with small hills having a relief of about 20 feet above the surrounding plain. Horst Cave and nearby Gehman Cave are situated beneath such hills. The hills are not due to the weather-resistant nature of the rock, which here is limestone of the Beekmantown Group; but on the contrary, the hills are the result of active decomposition of the limestone. The caves serve to funnel away most of the percolating rain water before the slightly acid water works on the calcareous limestone surface. The transfer of the action from the surface of the earth to the cave has resulted in the hills of the area. Some surface erosion occurs over the caves; and eventually the roof of the cave intersects the surface and destruction of the cave occurs. The large quantities of breakdown in Horst Cave indicate that the destructive process is well under way in that cave.

J. R. Reich, Jr.

Reference: 20

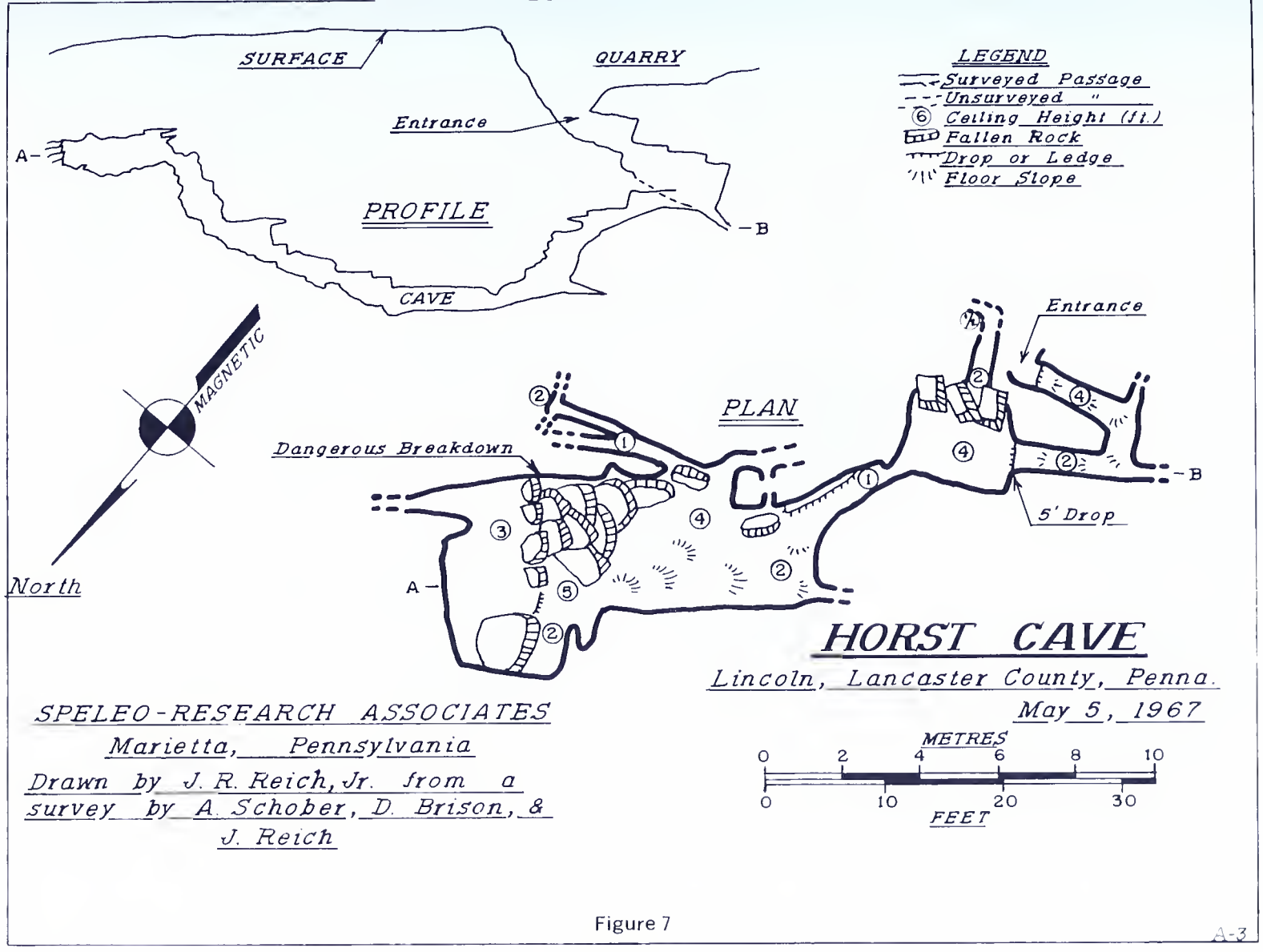

SURFACE
QUARRY
Entrance
A
B
PROFILE
CAVE
LEGEND
Surveyed Passage
Unsurveyed "
⑥ Ceiling Height (ft.)
Fallen Rock
Drop or Ledge
Floor Slope
MAGNETIC
North
PLAN
Dangerous Breakdown
Entrance
5' Drop
HORST CAVE
Lincoln, Lancaster County, Penna.
May 5, 1967
SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
Drawn by J. R. Reich, Jr. from a survey by A. Schober, D. Brison, & J. Reich
METRES
0 2 4 6 8 10
0 10 20 30
FEET

Figure 7

A-3

KINZERS CAVE

In a railroad cut about 0.5 mile west of Kinzers, a cave (Figure 8) found by Charles Landis Jr., runs south 27 feet. The cave is a passage 2 to 5 feet in height with no speleothems. The cave is in the Vintage dolomite of Cambrian age. The map made by the Landis brothers on May 29, 1955, shows an inward slope and a cavity on the east side near the far end. The cave is on property belonging to the Pennsylvania Railroad.

Bernard L. Smeltzer

Reference: 20

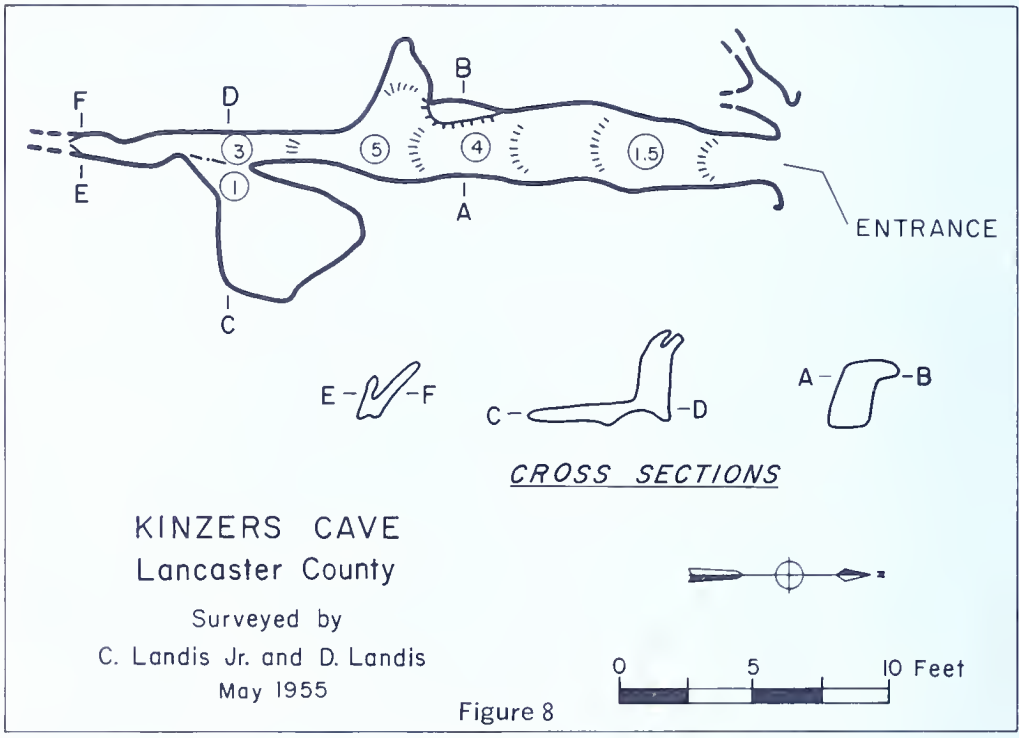


Figure 8

KURTZ QUARRY CAVE NO. 1

The A. G. Kurtz quarry, owned by Kurtz Brothers Concrete, Inc., Ephrata, Pa., is situated on the south bank of Cocalico Creek, one mile west of Ephrata and across U.S. Route 222 from the Ephrata Sewage Disposal Plant. This quarry was in full operation 30 years ago but it is now abandoned and nearly half flooded. The cave (Figure 9) is just above water level and 40 feet down the western quarry wall.

In order to reach the entrance it is necessary to descend 40 feet down the sheer quarry wall. It is imperative, therefore, that anyone wishing to see this cave should have full knowledge of safe and proper mountaineering techniques.

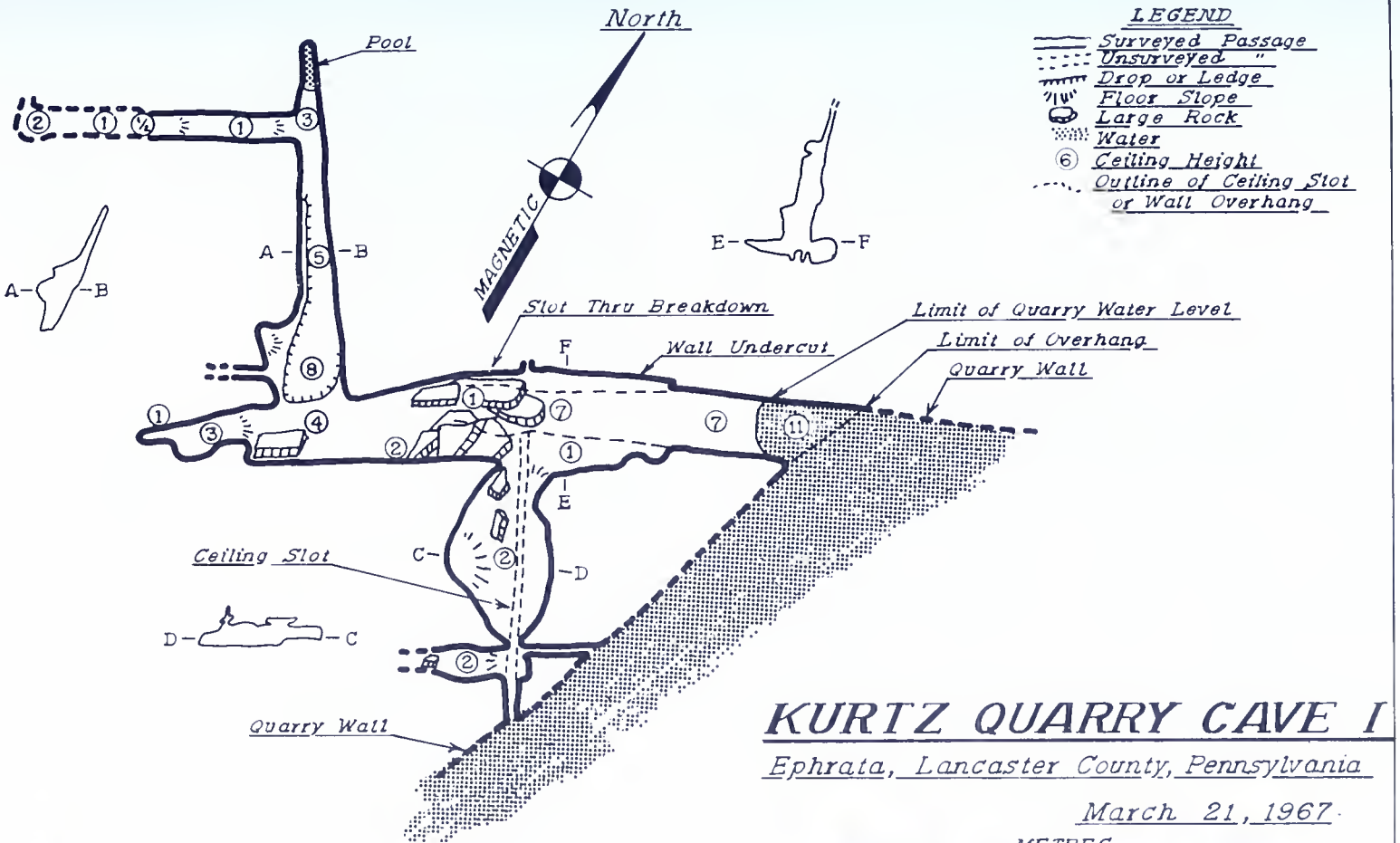

North
Pool
MAGNETIC
LEGEND
Surveyed Passage
Unsurveyed "
Drop or Ledge
Floor Slope
Large Rock
Water
⑥ Ceiling Height
Outline of Ceiling Slot or Wall Overhang
A-B
E-F
Slot Thru Breakdown
Limit of Quarry Water Level
Limit of Overhang
Wall Undercut
Quarry Wall
Ceiling Slot
C-D
D-C
Quarry Wall
KURTZ QUARRY CAVE I
Ephrata, Lancaster County, Pennsylvania
March 21, 1967
METRES
0 2 4 6 8 10
0 10 20 30
FEET
SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
Drawn by J. R. Reich, Jr.
from a survey by D. Brison, J. Young,
T. Sweitzer, and J. Reich.

Figure 9

The entrance, four feet wide and 11 feet high, projects out over water making it difficult to get inside the cave without becoming partially wet. The entrance passage trends southwest for 15 feet to a breakdown blockade. A tight slot through the breakdown permits entry into the further reaches of the same passage. A short distance beyond the slot, an eight-foot high fissure passage intersects at right angles and by climbing down, one can follow it northeast for 23 feet to a small pool where the walls pinch together. Near the end of this passage a low crawl was excavated and found to head gradually upward to the southwest for 18 feet.

Returning to the entrance passage, at the base of the south wall where the breakdown blockade is encountered, a bedding-plane crawl may be followed for 15 feet southeast toward the quarry face.

Total passage length in the cave is 120 ft.

The cave occurs in dark gray, fine-grained marble beds of the Conococheague Group which strike N87°E and dip NW24° (Miller, B. L., 1934). The cave passages are of phreatic origin and they conform in a classic manner to a pair of exactly perpendicular joints, bearing N62°E and N28°W. Breakdown modification may be partially due to quarry blasting. No speleothems are present.

David N. Brison

References: 13, 16

KURTZ QUARRY CAVE NO. 2

In the unflooded portion of Kurtz quarry there is a small cave, 15 feet long, which opens into the southeast quarry wall at the top of a short talus slope. The entrance is head-high and three feet wide. At a point 15 feet southeast of the entrance a bank of yellow earth meets the ceiling to prevent further progress.

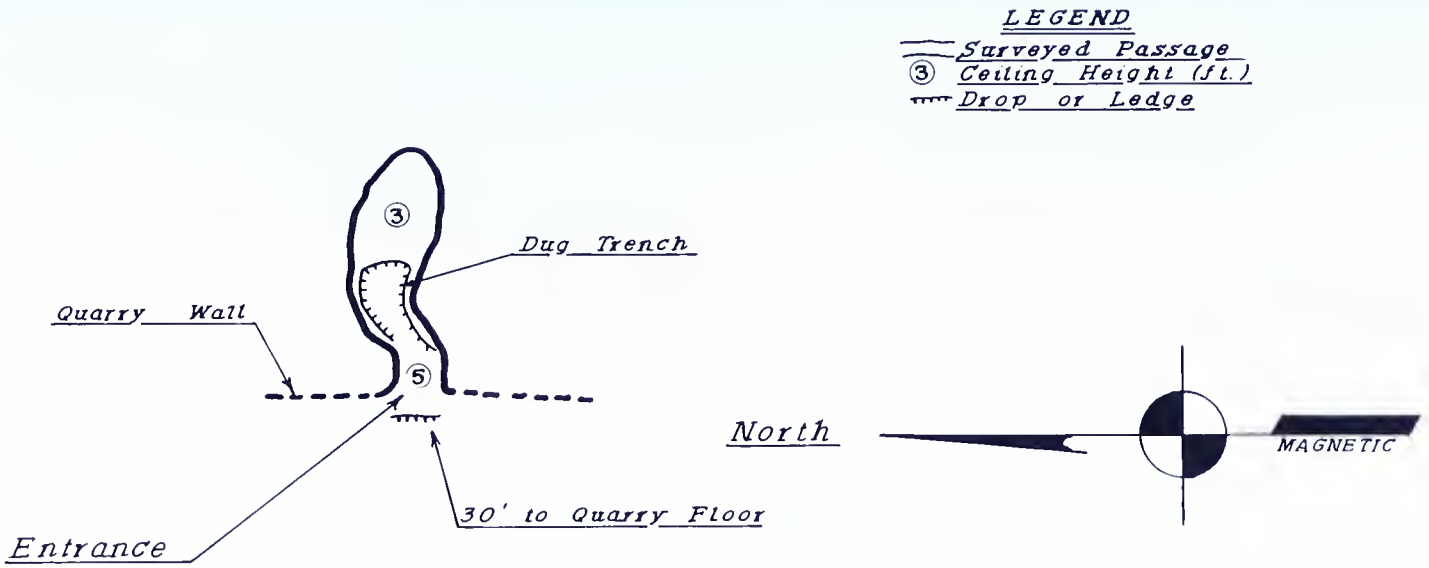
The cave (Figure 10) is merely an isolated solution pocket developed in wavy beds of magnesian marble of the Conococheague Group (Jonas, A. and Stose, G., 1930). The deep yellow earth fill covering the floor of the cave represents weathered, insoluble residue.

David N. Brison

Reference: 13

LAMPETER CAVE

A cave (Figure 11) in West Lampeter Township is about 2.5 miles south of the Lincoln Highway (U.S. Route 30) where it crosses Conestoga Creek, and 0.5 mile south of Hollister on Route 72. The cave is in the



SPELEO-RESEARCH ASSOCIATES

Marietta, Pennsylvania

Drawn and surveyed by

J. R. Reich, Jr.

KURTZ QUARRY CAVE II

Ephrata, Lancaster County, Pennsylvania

June 15, 1967

Figure 10

A 14

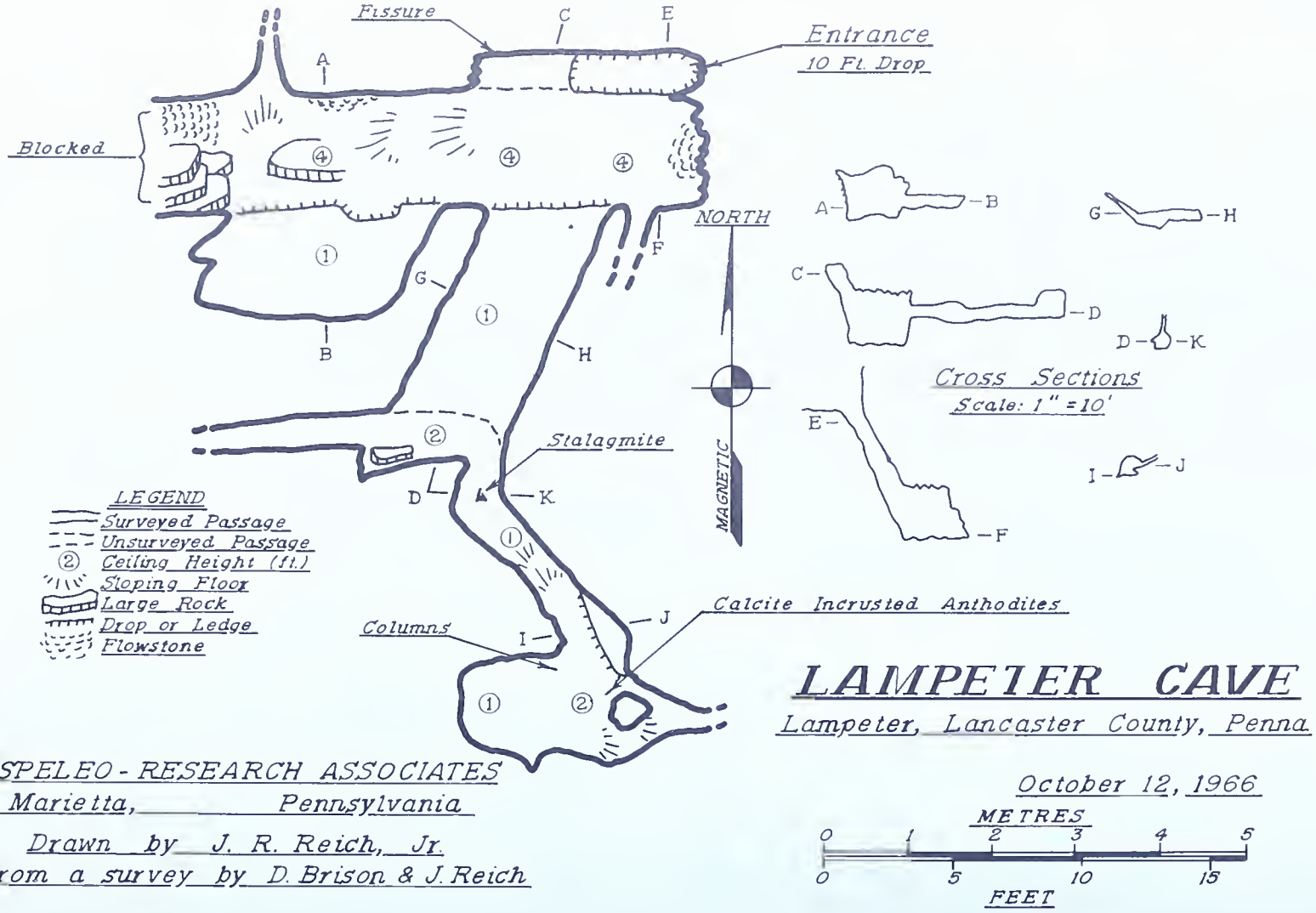

Fissure
Entrance
10 Ft. Drop
Blocked
NORTH
MAGNETIC
Stalagmite
Columns
Calcite Incrusted Anthodites
LEGEND
Surveyed Passage
Unsurveyed Passage
Ceiling Height (ft.)
Sloping Floor
Large Rock
Drop or Ledge
Flowstone
Cross Sections
Scale: 1" = 10'
LAMPETER CAVE
Lampeter, Lancaster County, Penna.
SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
Drawn by J. R. Reich, Jr.
from a survey by D. Brison & J. Reich
October 12, 1966
METRES
FEET

Figure 11

east side of a low hill, 400 feet west of the Abe King Farm on Gypsy Hill Road. The second cave, now closed, is located about 0.5 mile east of the main cave. The caves are on property belonging to Earl Ranck of R. D. 1, Ronks.

The main cave was originally discovered while quarrying for limestone. The entrance became closed with dirt and rock fill about 1915. Encouraged by Dr. Herbert Beck of Lancaster, local farmers uncovered the entrance on October 21, 1953. The second cave was discovered and opened by Dennis McGill of Lancaster.

The entrance to the first cave is a narrow cleft with a drop of five feet. The cleft gives access to an opening about 20 feet long, 5 feet wide, and 2 to 4 feet high. The floor of this grotto is completely covered with loose rock presumed to have fallen in from the entrance. It is said that when originally opened one could walk from this first room along a passage with large formations. Opposite the entrance, a horziontal fissure, ten inches high, leads to a sinuous crawlway 25 feet long.

The second cave is reported to consist only of a crawlway over 40 feet long.

Lampeter Cave was probably a well decorated cave at one time. Only stumps remain where beautiful stalactites once hung. Unscrupulous visitors removed the stalactites from the cave. Evidence remains in the stumps however, that the stalactites in the cave were light colored, sometimes approaching whiteness.

The main cave at Lampeter is developed in what appears to be vertical beds of limestone of the Conestoga Formation. The limestone is here a dark-blue, argillaceous, and thin-bedded stone. The cave appears to be the result of shallow phreatic solution.

J. R. Reich, Jr.

Reference: 22

LANDIS QUARRY CAVE

A very interesting cave, now closed, was located in the H. K. Landis limestone quarry three miles west of Mount Joy and 4.5 miles north of Marietta. The quarry can best be reached by traveling west on the Donegal Springs Road from Mount Joy; the first hard-surfaced road leading directly to the quarry. The quarry is flooded, by water emerging from the cave, to a depth of over 75 feet, making the cave inaccessible.

The entrance to Landis Quarry Cave (Figure 12) was ten feet wide, four feet high, and six feet higher than the quarry floor. The small stream of water that continuously flowed from the entrance of the cave made entry difficult in the summer and nearly impossible in the winter

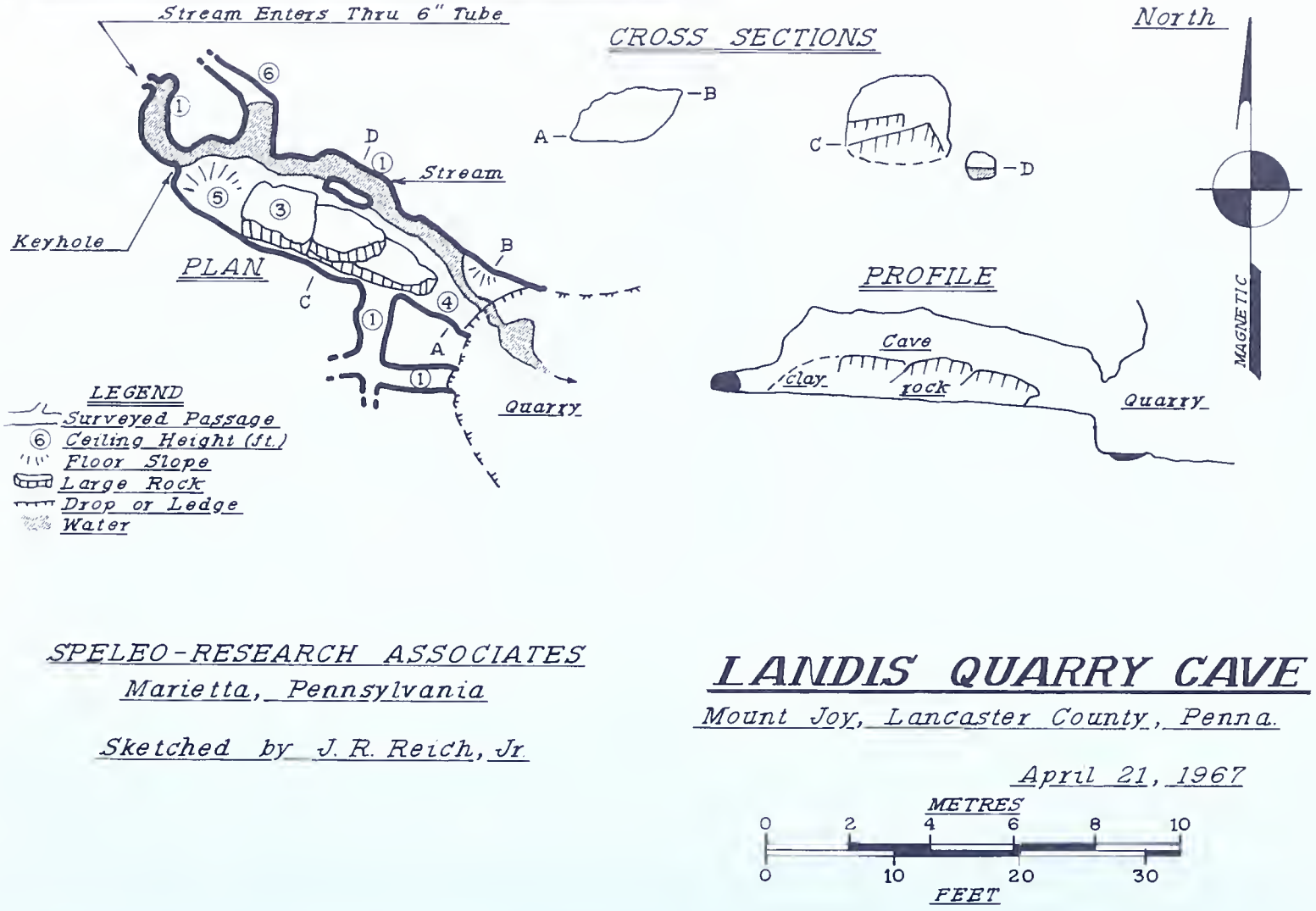
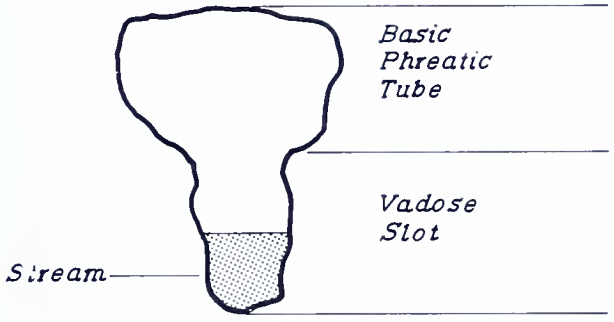

Stream Enters Thru 6" Tube
Keyhole
Stream
Quarry
PLAN
CROSS SECTIONS
A
B
C
D
North
MAGNETIC
PROFILE
Cave
clay
rock
Quarry
LEGEND
Surveyed Passage
Ceiling Height (ft.)
Floor Slope
Large Rock
Drop or Ledge
Water
SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
Sketched by J. R. Reich, Jr
LANDIS QUARRY CAVE
Mount Joy, Lancaster County, Penna.
April 21, 1967
METRES
0 2 4 6 8 10
0 10 20 30
FEET

Figure 12

A-8



SKETCH OF KEYHOLE PASSAGE
IN LANDIS QUARRY CAVE

(NO SCALE)

Speleo-Research Associates Figure 13

when ice covered the rock surfaces at the entrance. The cave headed northwest with a massive breakdown floor approximately at the same dimensions for a distance of 60 feet. A keyhole shaped opening (Figure 13) at the rear of that main passage led to a short tunnel and a six-inch tube from which issued the mysterious little subterranean stream. Short side passages near the entrance and at the rear of the cave all ended in clay fills.

Landis Quarry Cave was noted for its display of boxwork formations similar to those found in Wind Cave, South Dakota. The boxwork in Landis Quarry Cave was a result of the dissolution of the bedrock limestone from around veins of quartz and calcite. This process left thin sheet-like veins interconnected and protruding from the cave wall.

Landis Quarry Cave appeared to be the result of phreatic waters which had dissolved a conductive bed of the southeasterly dipping limestone of the Beekmantown Group. The vadose stream which had invaded the cave had only modified it slightly as was evidenced in the small keyhole shaped passageway near the end of the cave. The large upper part of this keyhole passage was the basic tube dissolved under phreatic conditions whereas the lower narrow portion was a result of the vadose stream.

The cave extended over 400 feet southeast of the entrance before the quarry operations destroyed that part of the cave. The author believes that the waters of the cave stream eventually found their way into the Donegal Springs system which is about a mile to the southeast. While the quarry was in operation, water from the cave was pumped into an open drainage channel on the surface. The water flowed half of a mile through this ditch where a sinkhole swallowed the stream into the depths. The water resurged in Donegal Springs to the southeast.

J. R. Reich, Jr.

LEAMAN CAVE

A cave (Figure 14) on the property of E. A. Leaman, R. D. 1, Strasburg, is located in a quarry 0.25 mile east of New Providence and near the intersection of U.S. Route 222 and White Oak Road. The cave's entrance which is three feet wide and seven feet high is nearly 25 feet from the quarry floor. The cave is merely a narrow, dusty fissure 15 feet long in limestones of the Conestoga Formation which dips here 20° to the north. Several large, open solution pockets are also located in the quarry.

J. R. Reich, Jr.

LITITZ SPRINGS CAVES

The noted Lititz Springs are located in a park 0.25 mile west of the square in Lititz and are owned by the Moravian Church. The spring drains into a large pool which empties its flow eastward through the park and down into Lititz Run. The caves (Plate 3) are located in a stone masonry wall built around the springs.

Cave Number One—The entrance to the first cave, now closed with a masonry wall, is an arch 5 feet high and 3 feet wide. Ten feet inside the

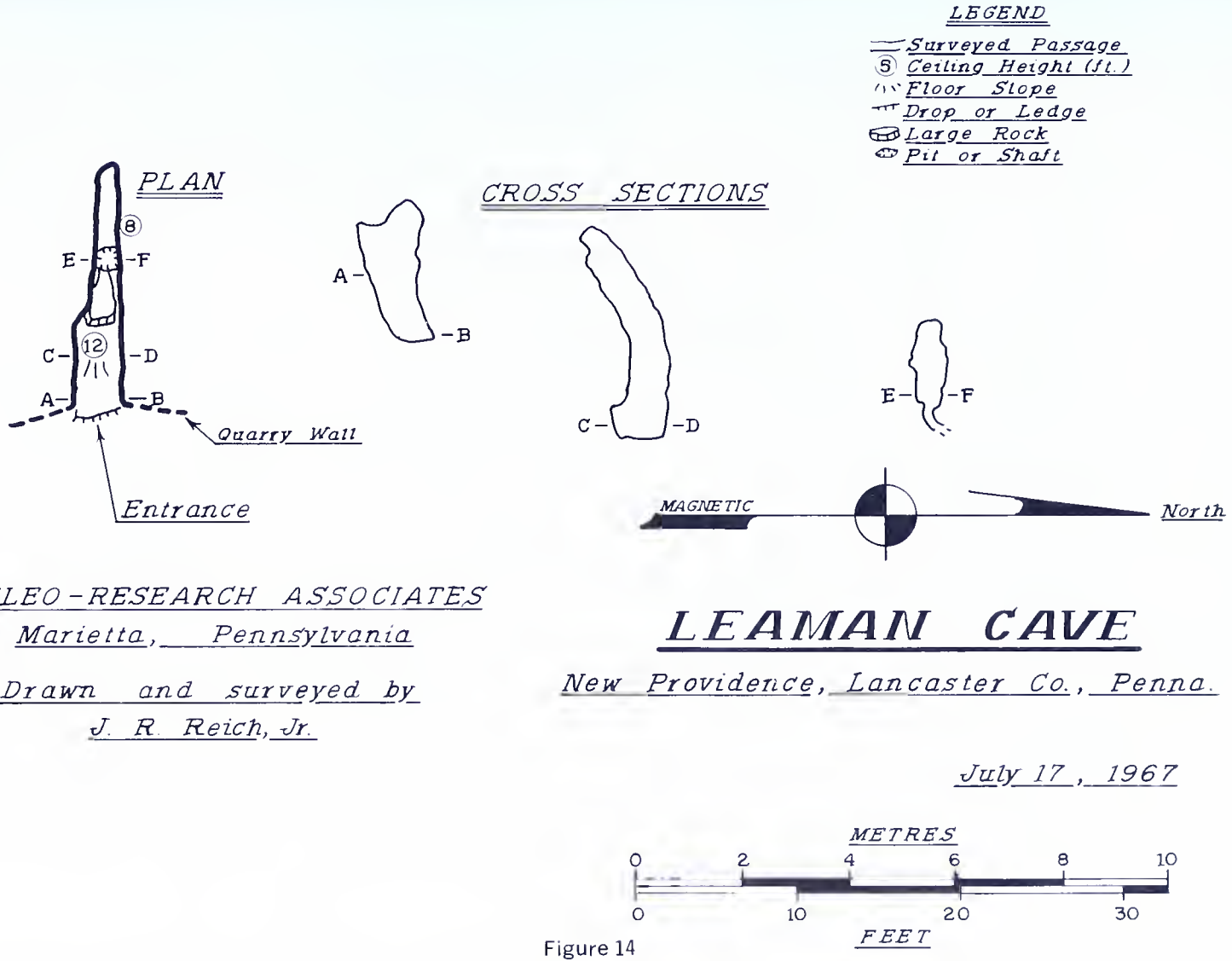

LEGEND
Surveyed Passage
8 Ceiling Height (ft.)
Floor Slope
Drop or Ledge
Large Rock
Pit or Shaft
PLAN
8
E
F
12
C
D
A
B
Quarry Wall
Entrance
CROSS SECTIONS
A
B
C
D
E
F
MAGNETIC
North
SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
Drawn and surveyed by
J. R. Reich, Jr.
LEAMAN CAVE
New Providence, Lancaster Co., Penna.
July 17, 1967
METRES
0 2 4 6 8 10
0 10 20 30
FEET

Figure 14

entrance the main cave turns northwest while a short crawlway heads 10 feet in the opposite direction. The northwesterly passage extends 26 feet to a breakdown choke. Intensely folded rock and a one foot diameter chimney 7 feet high are located midway in this northwesterly passage.

Cave Number Two—The second cave is entered through a one foot diameter hole which has been carved into the rock here. The entrance is located between the first and third cave and is filled with water most of the time. An inscription above the entrance reads, "Gottes Brunnlein hat Wasser die Fulle," which means "God's Spring has much water." The cave is a slanting fissure 20 feet long and 10 feet high. There are several large breakdown boulders imbedded in the ceiling of the cave.

Cave Number Three—The entrance to the third cave is located 30 feet north of the first cave. The entrance is a vertical fissure, a foot and one-half wide and 5 feet high. The cave follows a sinuous path generally north for a distance of 30 feet. One right-angle bend in the passage of this cave is nearly impossible to negotiate. This second cave is occupied by a small stream of water throughout much of the year.

Cave Number Four—The so-called Fourth cave is just a solution pocket two feet wide, three feet high, and five feet long.

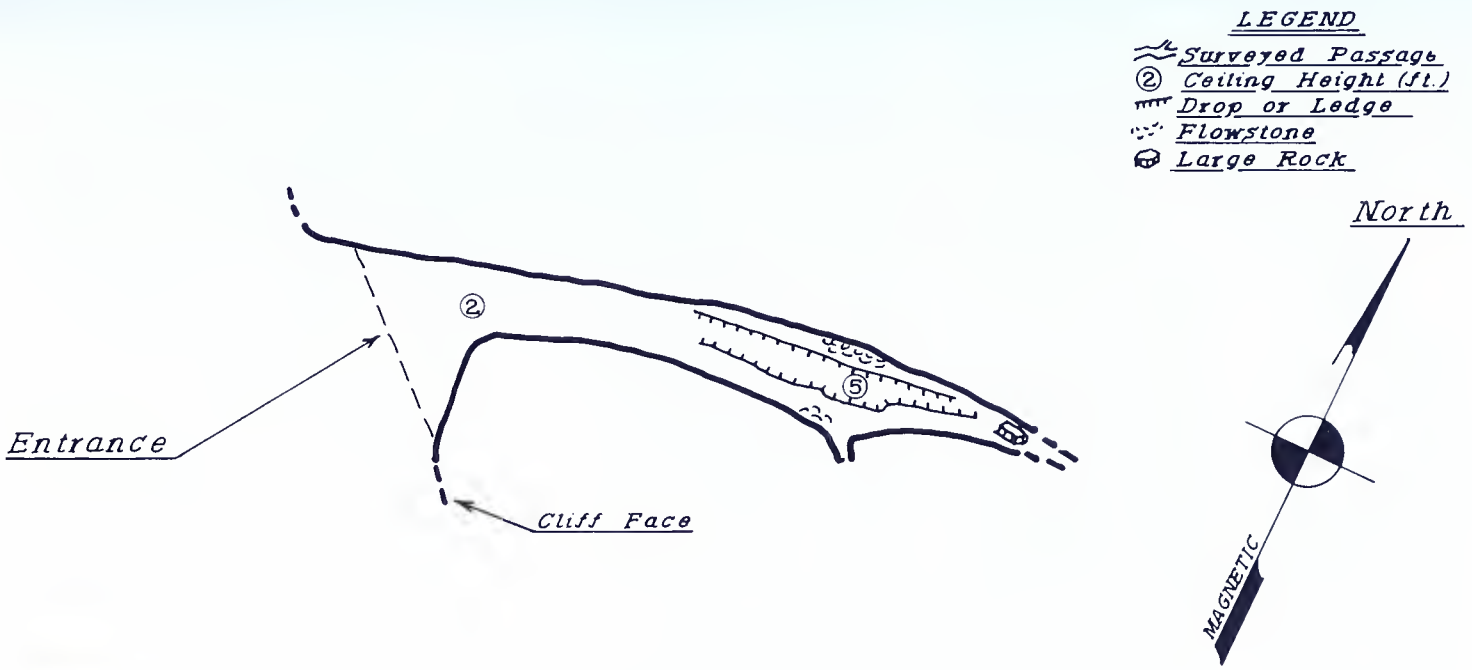
The Lititz Springs Caves are evidently a result of phreatic solution. Caves two and four are little more than enlarged joint planes whereas the first cave clearly shows its phreatic origin in the elliptical cross-section of its passage. The caves are the past outlets of the subterranean waters of the spring where the waters of the spring now issue mainly from lower outlets. The caves, being left high and dry by the descended waters, are now subject to vadose action as is evidenced in the small chimney in the first cave and the small stream in the second cave. The caves and the springs are formed in limestone of the Conococheague Formation.

J. R. Reich, Jr.

MARTIN CAVE

A small cave (Figure 15) located along Middle Creek and three miles northwest of Ephrata is situated on property belonging to Ivan Z. Martin, R. D. 1, Lititz. The cave entrance opens at the base of a low limestone cliff in a pasture 100 yards northwest of the Martin residence. The cave is an eastwardly trending passage averaging 3 feet wide and 2 to 5 feet high. Twenty-five feet from the entrance the passage narrows to a tiny fissure. Small amounts of flowstone may be found at the rear of the cave.

The cave is essentially an elliptical phreatic tube. Slight vadose modification has occurred near the end of the cave in the form of a floor



SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania

Drawn by J. R. Reich, Jr from a survey by D. N. Brison

MARTIN CAVE

Ephrata, Lancaster County, Pennsylvania

June 20, 1967

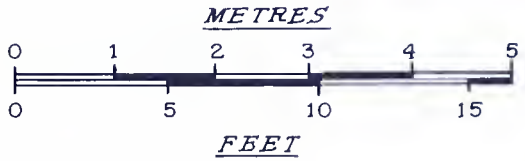


Figure 15

A-13

trench. Many eroded boulders near the cave indicated the soluble nature of the limestone here.

J. R. Reich, Jr.

MIDDLE CREEK CAVE

A small cave (Figure 16) located by D. N. Brison in 1965 is found along Middle Creek three miles west of Ephrata. The cave is essentially a crawlway two to 3 feet high and 15 feet long.

J. R. Reich, Jr.

MOUNT HOPE BOULDER CAVES

The report on the geology of the Lancaster quadrangle (Jonas and Stose, 1930) mentions and illustrates some diabase boulder caves located one mile northwest of Mount Hope. The largest of these may be reached by traveling north on Pa. Route 72 for exactly 0.5 miles from the bridge crossing the Pennsylvania Turnpike. Then hike roughly east, following the power lines, for 530 yards.

This boulder cave consists of a boulder-capped slot, open at either end. The room is 24 feet long, 3 feet wide and 7 feet high; and in many ways it bears a striking resemblance to Governor's Stables. The space resulted when a large mass of intrusive diabase fractured into three basic sections which, in turn, were displaced or shifted apart.

Several smaller diabase boulder caves may be found 400 yards farther east along Shearers Creek. Here, in a picturesque setting, the creek and one of its feeders disappear for brief stretches beneath the massive boulders.

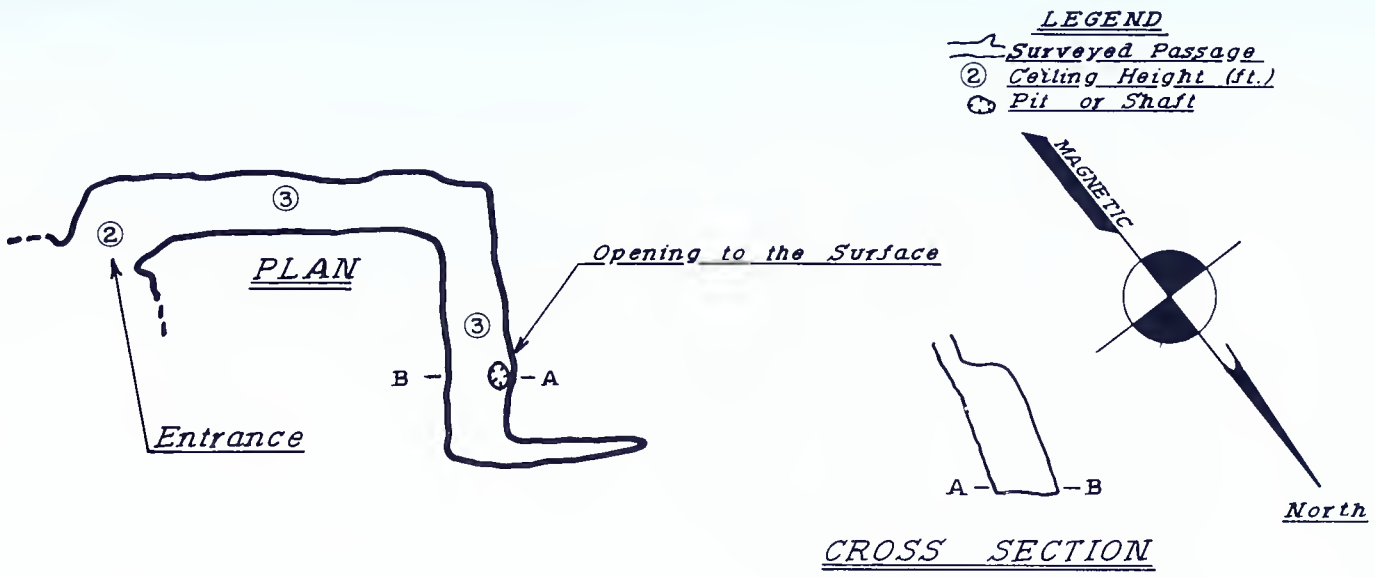
David N. Brison

Reference: 13

MOUNT JOY CAVE NO. 1 (COVE CAVE)

Mount Joy Cave No. 1 (Plate 4) is situated in a limestone quarry about 0.5 mile northeast of the community of Mount Joy. The quarry is just north of the Little Chickies Creek at Mount Joy's picnic park, known locally as the Cove, and on the western perimeter of a pasture there.

The entrance to Mount Joy Cave is situated about ten feet higher than the quarry floor. A short scramble up a rocky slope brings one to a ledge overlooking the quarry and pasture. The entrance, 3 feet wide and 4 feet high, gives access to a westwardly heading crawlway, 2 feet wide, 2 feet high, and thirty feet long. Here the crawlway splits, with one branch pinching out after 5 feet in a southwestwardly direction. The



SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania

Drawn by J. R. Reich, Jr. from a survey by D. N. Brison

MIDDLE CREEK CAVE

Ephrata, Lancaster County, Penna.

June 12, 1967

Figure 16

A-15

other branch continues northwest 10 feet through a very tight squeeze, one foot high and wide. One here encounters a southwestwardly trending tunnel, 2 feet high and 5 feet wide. A large stalagmite almost prevents further progress into the cave. Traveling to the end of this tunnel, one encounters another passage five feet wide and up to five feet high. To the south, this passage continues 10 feet to an extremely small crawlway, and beyond that, 5 feet to a small stream and the end of the passage. Traveling northwest from the intersection, one crosses a low barrier of stalagmitic deposits, into a passage 5 feet wide, up to 4 feet high, and 15 feet long. The explorer here encounters a very dangerous portion of the cave. Large quantities of unstable breakdown are present as one climbs 5 feet to a higher passage. This passage, 3 feet wide and up to 5 feet high, extends northeast 15 feet over breakdown to a small dome 7 feet high. The passage continues southwest 15 feet over breakdown with the same dimensions to another junction. Here, the small northwest crawlway opens directly into a small chamber 10 feet long, 5 feet wide, and 3 feet high. In the opposite direction, a small hole drops through breakdown into a southeastwardly trending passage, 2 to 5 feet wide, 5 feet high, and 25 feet long. Near the end of this passage is found the same stream encountered earlier in the cave. It is the same stream that resurges in Mount Joy Cave No. 2, 300 feet to the east and along Little Chickies Creek.

A dye test was conducted on the spring at the rear of Mount Joy Cave No. 1 on April 21, 1962. Four ounces of fluorescein dye were placed in said spring. Forty minutes later the dye was observed emerging from a spring in Mount Joy Cave No. 2 along Chickies Creek. The dye then continued into the creek to conclusively prove that the two springs, one at the back of Cave No. 1 and one in Cave No. 2 are connected. These 2 springs are approximately 300 feet apart. The speed at which the dye traveled indicated a direct ground-water route, i.e., a cave passage, and not the slow-moving diffusion of subterranean waters.

As in Mummau Cave, to the northwest, Mount Joy Cave seems to be the result of solution of limestone in the Beekmantown Group, along 2 major joint systems, one trending northwest and the other perpendicular, bearing northeast. The 30 foot long entrance passage appears to be the result of strike oriented, bedding plane solution.

The bedding of the Beekmantown here dips approximately 15° to the south. Passages trending downdip usually end in clay fills, whereas passages trending updip are choked by massive breakdown blocks.

The possibility for a large cave system exists here above all other places in Lancaster County. The Mount Joy area has the greatest concentration of caves and karst features in the county. The Beekmantown limestone is quite conducive to cavern formation and the presence of the

overlying shale of the Cocalico Formation, just to the north, heightens the possibility of large caverns, although the shale obscures surface indications of caves. Diligent searching will undoubtedly produce a cave system of great magnitude.

J. R. Reich, Jr.

MOUNT JOY CAVE NO. 2

This historic cave (Figure 17) is situated directly on the west bank of Little Chickies Creek, 226 feet east of the entrance to Mount Joy Cave No. 1. The earliest known reference to this cave is in an article in the *Mount Joy Star* of November 26, 1873. Therein a tale was related about a hermit, who for several years prior to 1765, used the nearby cave (No. 1) for his residence. The hermit claimed that he had also explored the cave by the creek (No. 2) and found it to extend west "over one mile" all the way to Springville (now Florin). In 1820, a sailor named Daniel Harris dove through the pool at the entrance to Cave No. 2, explored it, and claimed to find "a large dark room". (Sheller, 1873)

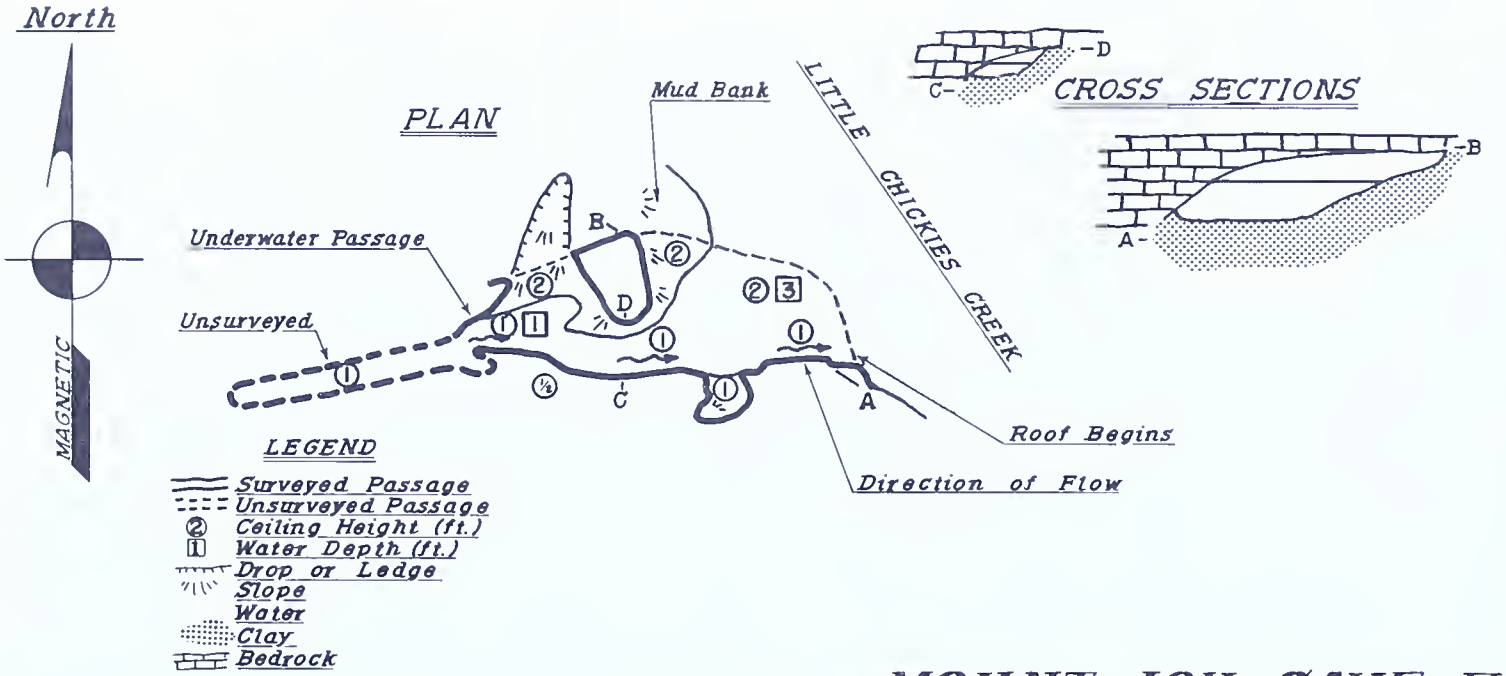
Over the years, heavy local flooding has almost totally plugged the cave with silt and mud. William Hickok reported that in 1932 the cave was 40 feet long, 2 to 3 feet wide, and about 2 feet high.

The entrance to Mount Joy Cave No. 2 consists of a broad, low opening at the base of a 15-foot-high cliff. The main entrance is 17 feet wide and partially overhangs the creek which in this area is usually 2 feet deep. Just inside this entrance, the ceiling height above water is two feet, but 15 feet farther in, it is less than one foot. The extremely soft mud and silt underwater make it almost impossible to proceed more than seven feet into the cave from this direction.

In the summer of 1965, Jay Reich and several students from Lampeter-Strasburg High School, dug through the silt deposits which had completely plugged the western half of the cave opening. This side entrance is 20 feet northwest of the creek entrance. By crawling in here, it is possible to look back to the east and see light coming in from the creek entrance. A physical connection would require much work.

By crawling a short distance west from the side entrance, one can squeeze into a muddy crawlway which heads west for 15 feet and has an average width and height of one foot.

Fluorescein dye tests have established that Mount Joy Cave No. 2 is the resurgence for the stream waters in the lowest portions of Cave No. 1. On two different occasions it took the dye 45 minutes to travel 285 feet from the spring in Cave No. 1 to the point where the cave waters mingle with the creek water inside the main entrance of Cave No. 2. The majority of the intervening passages that comprise this water connection



MOUNT JOY CAVE II

Mount Joy, Lancaster County, Penna.

Nov. 2, 1968

METRES 0 2 4 6 8 10

FEET 0 10 20 30

SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania

Drawn by J. R. Reich, Jr.
from a survey by D. Brison
and D. Ibberson.

Figure 17

are probably heavily silted up and also largely destroyed as a result of the quarrying operations that took place immediately above them.

Both the silting and the quarrying were also responsible for the disappearance of two low caves that once existed at the base of the original cliff wall somewhere between Caves No. 1 and 2. These lost openings occurred more or less in line with the westward trend of the passage in Cave No. 2 and probably at one time connected with it.

Mount Joy Cave No. 2 occurs in the north limb of an east-west bearing syncline. The limestone beds of the Beekmantown Group here dip gently 15° to the south and strike N65°E. The cave passage developed along the strike entirely within the phreatic zone. A phreatic relic in the form of a solution wall-pocket can be found just outside the stream entrance.

Viewed in geomorphic relation to nearby Cave No. 1, Mount Joy Cave No. 2 together with the impassable underground stream passages would appear to represent a lower, more recent cave system which has pirated the vadose waters from the higher fossil passages of Cave No. 1

David N. Brison

References: 19, 21

MOUNT JOY CAVES NO. 3, 4, AND 5

These caves (Figure 18) are located along the south bank of Chickies Creek, one mile north of Mount Joy and 100 yards east of the picnic grounds locally known as the Cove.

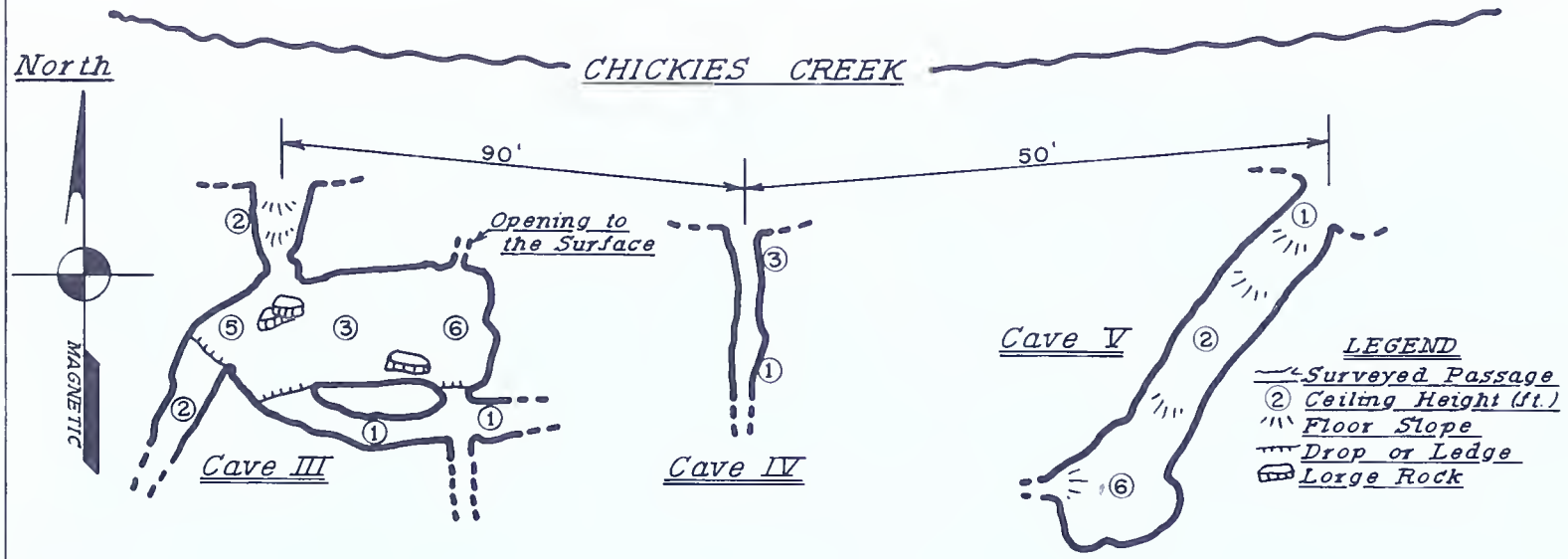
The third cave is located 20 feet back from the creek, at the base of a small limestone cliff. The entrance is a hole, two by two feet, leading steeply downward to a room 15 feet long, 7 feet wide, and up to 6 feet high. Several short crawlways branch off from this room and terminate within short distances.

The fourth cave is located 90 feet east of the third. This fourth tube is three feet high at the entrance and gradually closes at the inner end so that a man can advance no further.

The entrance to the fifth cave is located high on the cliff and 50 feet east of the fourth cave. A steep trail leads upward from the creek to the mouth of the cave. The cave is just a downward sloping tunnel, 20 feet long, 3 feet wide, and from 1 to 6 feet high.

All three caves are located within limestone beds of the Beekmantown Group which here dips gently to the south. Caves Three and Four exhibit small elliptical phreatic-dissolved passages. No vadose modification was observed in any of the caves.

J. R. Reich, Jr.



MOUNT JOY CAVES
III, IV, and V

Mount Joy, Lancaster County, Pennsylvania

April 22, 1967

SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
Drawn and surveyed by
J. R. Reich, Jr.

Figure 18

MOUNT PLEASANT CAVE

Mount Pleasant Cave (Figure 19) is situated in an abandoned limestone quarry, about two miles north of Mount Joy, 0.5 mile east of Mount Pleasant Church, and 800 feet west of Little Chickies Creek. The quarry is near the road leading from Mount Joy to Milton Grove.

The entrance to the cave is about 15 feet higher than the quarry floor and is located in the southeast corner of the quarry. The cave opening, roughly 2 feet square, opens directly into a large passage trending west, and paralleling the south quarry wall. The distance between quarry wall and cave is not greater than three feet. The cave consists of one large passage or room, 30 feet long, 6 feet wide and up to 8 feet high. Large breakdown blocks resulting from past quarry operations litter the floor of the cave and make walking difficult if not hazardous. Both ends of the passage terminate in breakdown blockades.

J. R. Reich, Jr.

MUMMAU CAVE NO. 1

A large cave (Plate 5) of much interest may be found on Jay Mummau's farm, 2.5 miles northwest of Mount Joy, three miles east of Elizabethtown, and one mile south of Milton Grove. The cave can be reached by traveling north two miles on the road that intersects U. S. Route 230 just west of Florin (Mount Joy Borough). A small quarry on the west side of the road marks the site of the cave. The entrance to the cave is a small hole at the base of the north quarry wall.

The entrance was exposed by quarry operations in 1935 and was open only for a short time, during which there was one known exploration by two local men. During December 1954, rumors of this early exploration led National Speleological Society member Charles Landis, Jr., formerly of Paradise, Lancaster County, to excavate at many spots in the quarry in search of the entrance. On December 12, 1954, Landis and Bernard Smeltzer finally gained entrance to the cave.

The entrance (Figure 20) is a narrow, contorted pit, eight feet deep that opens directly into a low passage under the quarry floor. This low, sewer-like passage extends south 80 feet, then east 50 feet, then south again 70 feet. The roof of the cave in this particular passage is only six to eight feet below the quarry floor. Blasting in the quarry does not seem to have affected the cave in any manner. After the initial 200 feet, the main passage enlarges to a gallery (Figure 21) up to 20 feet high and 85 feet long. Several side passages branch from the main one near the entrance and near the end of the cave. A dome pit, 15 feet high, occurs in a side passage at the rear extremity of the cave. Total surveyed pas-

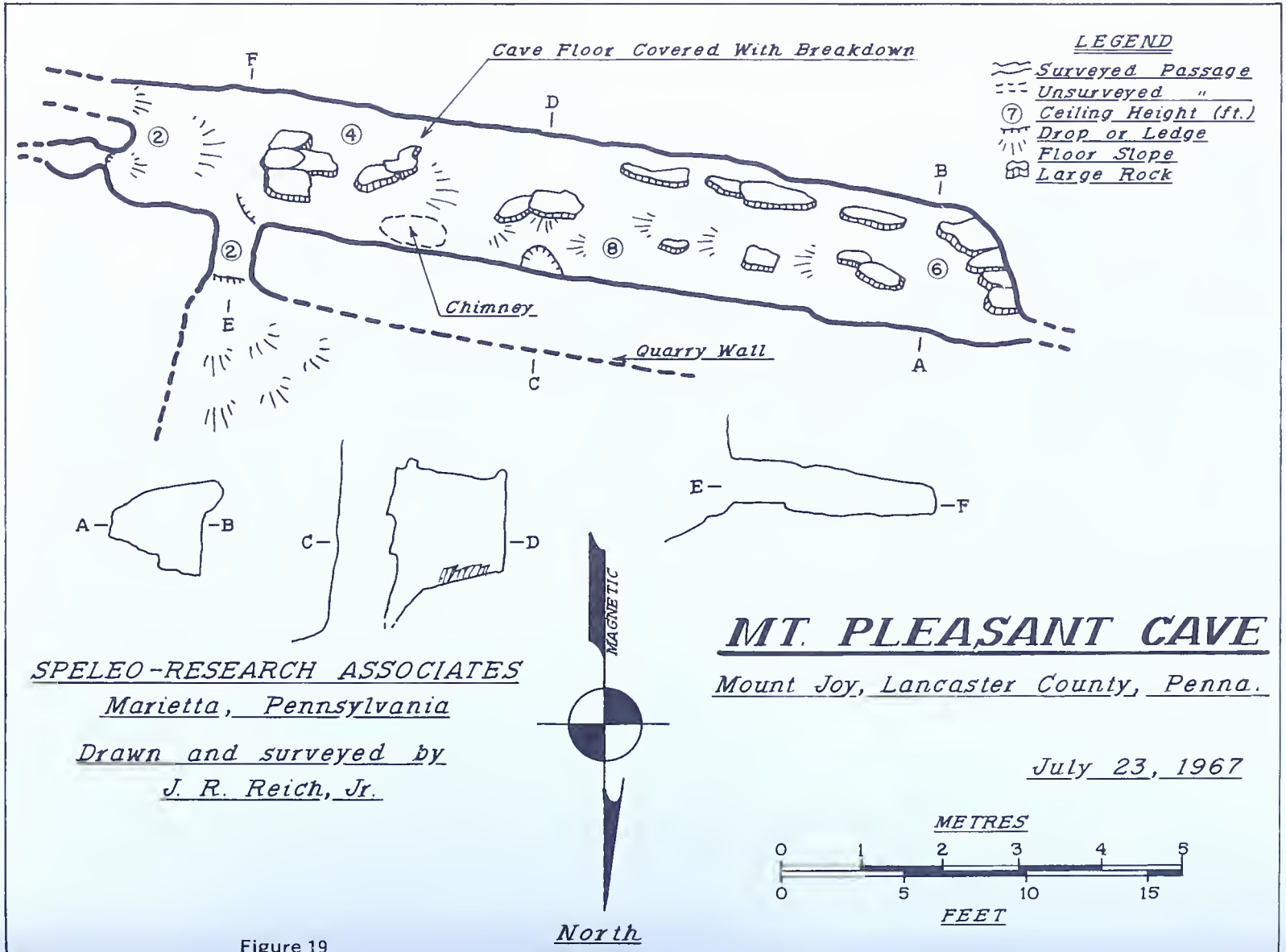

Cave Floor Covered With Breakdown
LEGEND
Surveyed Passage
Unsurveyed "
⑦ Ceiling Height (ft.)
Drop or Ledge
Floor Slope
Large Rock
F
D
B
A
C
E
Chimney
Quarry Wall
A—B
C—D
E—F
MAGNETIC
North
MT. PLEASANT CAVE
Mount Joy, Lancaster County, Penna.
July 23, 1967
SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
Drawn and surveyed by
J. R. Reich, Jr.
METRES
0 1 2 3 4 5
0 5 10 15
FEET

Figure 19

sages equal 540 feet. In addition to 60 feet of additional passages not surveyed, the total length of Mummau Cave is about 600 feet.

Mummau Cave has one of the finest displays of rare anthodites in the state of Pennsylvania (Figures 22 and 23). These unusual needle-like crystals of the mineral aragonite may be found in nearly all parts of the cave, but particularly near the entrance. Small stalactites of the soda straw variety are common. These thin, hollow tubes may be found growing in profusion in some parts of the cave. Near the entrance is a group of white stalactites exhibiting red iron stains in thin streaks. Massive, blood-red stalagmites near the entrance are particularly colorful when the waters from a rain-saturated earth splash upon them. Spongy masses of iron oxide and plates of the same material are distributed throughout the cave. Perfect quartz crystals may be found in the many veins of quartz that penetrate the limestone of the cave. The fragile beauty of

Figure 20 Directly inside the entrance of Mummau Cave No. 1, a low crawlway is encountered. This passage leads southward two hundred feet enlarging to a twelve-foot high gallery. The author examines two blood-red stalagmites near the entrance.

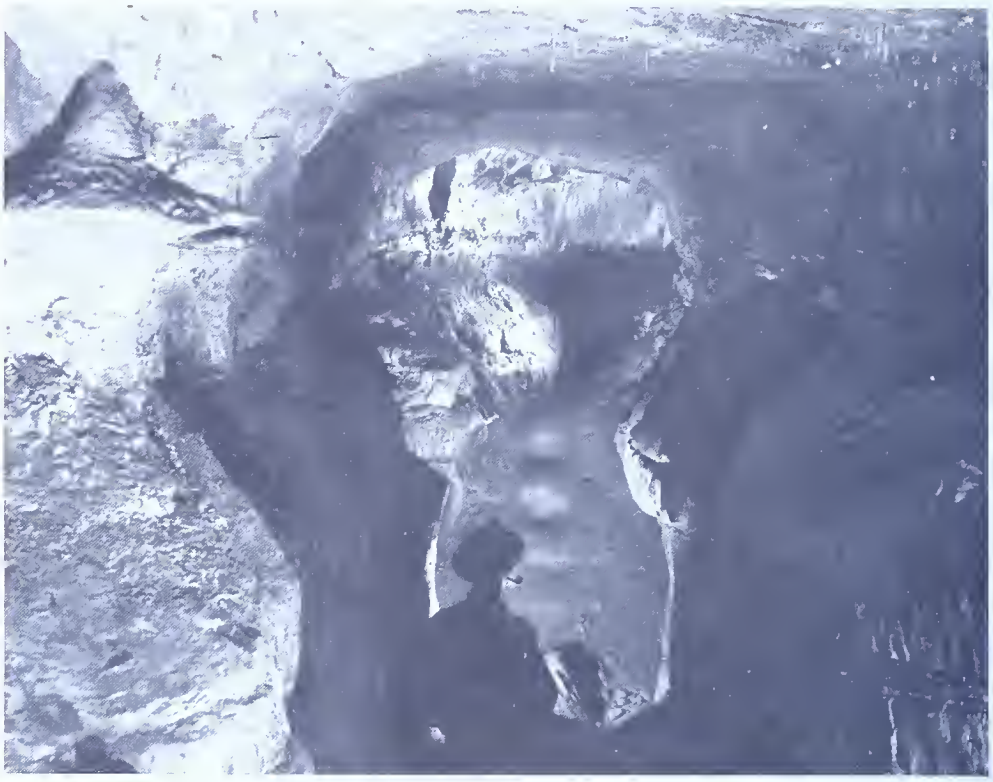


Figure 21 The main gallery in Mummau Cave is a keyhole-shaped passage twelve feet high. Note stalagmite on an undermined travertine shelf in upper left corner. The shelf was deposited on a clay bank subsequently removed by vadose waters.

these minerals can easily be destroyed by carelessness. Be careful, and take no specimens from the cave or from the cave entrance.

The topography in the vicinity of the cave is marked by long ridges with valleys up to 100 feet deep. Without exception, the ridges are capped with a layer of resistant shale of the Cocalico Formation, very thick in places. The hillsides and valley floors are carved into the Beekmantown Group of limestones, which is nearly 2000 feet thick at this locality. It is in the Beekmantown Group that the largest cave in Lancaster County, Mummau Cave, is excavated. The exact position of the cavernous beds in the stratigraphic column is unknown as the Beekmantown Group is not formally divided into its component units as it is in Berks and Lebanon Counties.

Mummau Cave is developed along three major joint systems in the nearly horizontal limestone. The first and most significant of the joint

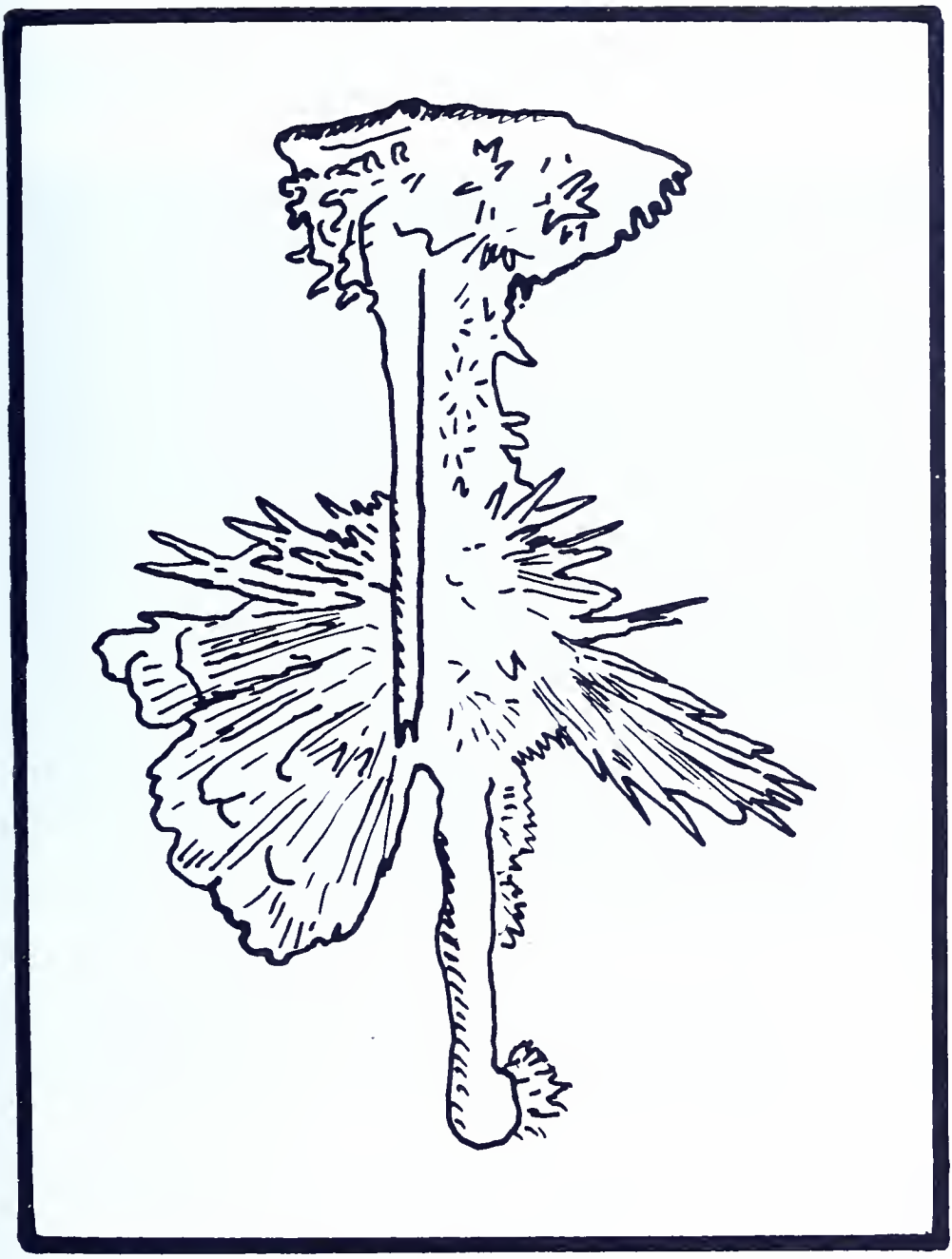


Figure 22 Sketch of anthodite from Mummau Cave. This anthodite ranges in color from pure white to tan. Drawn by Bernard Smeltzer.

systems is responsible for 270 feet of passages. This primary joint system extends north and is at right angles to the secondary system of joints which extends eastward. The secondary system of joints in the cave

is responsible for 170 feet of passages. The tertiary joint system extends northwest and has 80 feet of passages to its credit. Several other minor joints account for the remainder of the passages.

Figure 23 Anthodites grow in profusion in Mummau Cave No. 1. These fine specimens, growing near the end of the cave, contain aragonite crystals up to two inches long. Caves are not the place for mineral collecting. Do not disturb any cave minerals.

Mummau Cave is believed to be primarily phreatic in origin. There is much evidence of this origin in the shape of the passages (mostly elliptical) and in the clay of the floors. Solution of limestone in stagnant or very slow-moving phreatic waters would allow the argillaceous by-products of limestone solution to settle as a clay. The maze-like network of passageways at the end of the cave also lends some support to the theory of phreatic origin as suggested by Bretz, 1956.

There is also evidence of vadose modification in the cave. An undercut travertine shelf and a travertine bridge give testimony to a once higher floor level subsequently removed by vadose streams. A dome pit, 15 feet

high, appears to be developing along a joint originally enlarged by phreatic action.

J. R. Reich, Jr.

References: 6, 20

MUMMAU CAVE NO. 2

Mummau Cave No. 2 (Figure 24) is owned by Jay Mummau, R. D. 2, Mount Joy, Pa. Halfway up the quarry wall and 130 feet southeast of Mummau Cave No. 1, there is a debris-blocked entrance to a second cave which might represent the remnant of an older cave system. This cave was originally described by Bernard Smeltzer as "a tunnel five feet in diameter heading south for 42 feet" (Smeltzer and Stone, 1956).

Since 1955 the entrance has been sealed by a large debris slide. However, in August 1966, the entrance was relocated with the help of the present owner, Jay Mummau, and was dug open again by Dale Ibberson and David Brison.

The old dimensions fit the cave exactly. The passage is a simple phreatic tunnel occurring in horizontal limestone beds of the Beekmantown Group. The passage terminates at the south end in a shaly clay plug which probably represents contact with the overlying shale of the Cocalico Formation. A narrow quartz vein runs along the joint at the apex of the ceiling.

The ceiling base level of this second cave is 15 feet higher than that of the main cave. Both caves have developed primarily along north-south trending joints. When the maps of the two caves are oriented with each other it becomes evident that the smaller cave is only 20 feet east of the nearest parallel passage in the main lower cave. Attempts to establish an acoustical connection between the two caves met with no success.

The relative positions of the two caves would seem to indicate that the upper cave was formed in an earlier geomorphic setting, that is, prior to the lowering of the local water table by the downcutting and headward (westward) movement of the nearby tributaries of the Little Chickies Creek.

David N. Brison

Reference: 20

NISSLEY CAVE

A small cave (Figure 25) formed in vertical limestone beds of the Conestoga Formation is found on the farm of Ralph Nissley of Washington Borough. The cave is located 1000 feet southwest of the Nissley

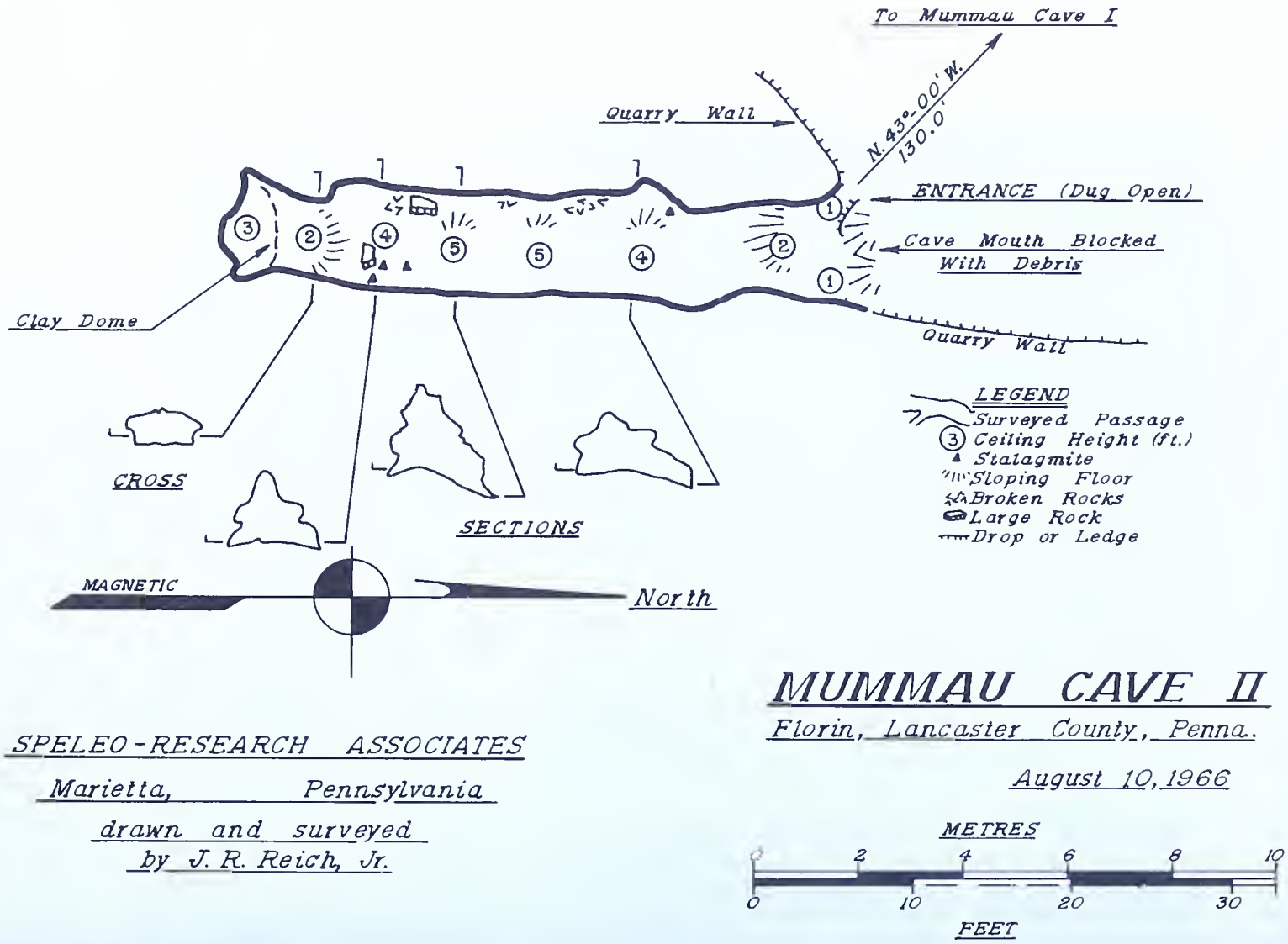
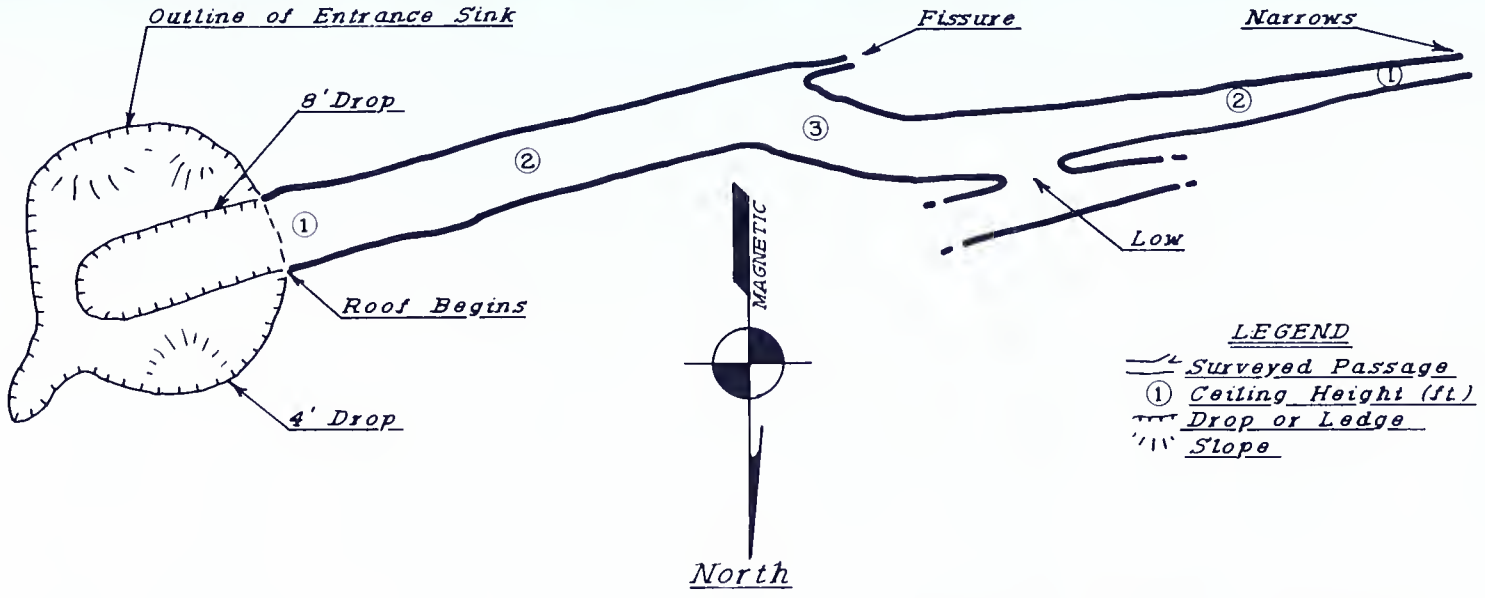

To Mummau Cave I
N. 43°-00' W.
130.0'
Quarry Wall
ENTRANCE (Dug Open)
Cave Mouth Blocked With Debris
Clay Dome
Quarry Wall
LEGEND
Surveyed Passage
3 Ceiling Height (ft.)
Stalagmite
Sloping Floor
Broken Rocks
Large Rock
Drop or Ledge
CROSS
SECTIONS
MAGNETIC
North
MUMMAU CAVE II
Florin, Lancaster County, Penna.
August 10, 1966
SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
drawn and surveyed
by J. R. Reich, Jr.
METRES
0 2 4 6 8 10
0 10 20 30
FEET

Figure 24



NISSLEY CAVE

Washington Boro, Lancaster County, Pa.

SPELEO-RESEARCH ASSOCIATES

Marietta, Pennsylvania

Drawn by J. R. Reich, Jr.

from a survey by D. Brison and J. Reich

April 22, 1967

METRES

0 1 2 3 4 5

0 5 10 15

FEET

Figure 25

A-9

farm buildings. A sink, 13 feet deep, provides access to a fissure-like passage about 40 feet long. The fissure is about two feet wide and up to three feet high. The Conestoga limestone here contains much pyrite, and many fine specimens of pyrite cubes were found near the cave.

J. R. Reich, Jr.

PECK'S CAVE

A cave reported to exist in the old Peck limestone quarry in Maytown is now closed. The quarry has been filled with dirt and debris to a point where it is nearly obliterated. The quarry was located 200 yards north of the present elementary school in Maytown.

(Anon. 1877; That Cave: *Marietta Register*(?) April 27(?), 1877, clipping in Raub Scrapbook, 1914). "THAT CAVE.—A great deal having been said and written about a cave recently discovered (Author's note recently being 1877) at Peck's quarry, near Maytown, we, four companions, determined to explore its unknown depths, and ascertain if possible whether gold in large quantities lay there ready for the valiant Maytowners to unearth. We arrived at the scene of action about ten o'clock in the morning, and immediately began our explorations of this grand cavern. We descended into the opening in a stooping posture, expecting soon to see the beautiful spring and roomy apartment where other explorers had sat themselves down to rest. We found on our entrance that we were completely covered with the celebrated "Maytown mud" and that the cave was filled with this same valuable deposit, so much that one of our party concluded not to venture in, and started for home where we all wished we were with him before many minutes. We found the cave merely a fissure in limestone rock, about 75 or 80 feet in length and so low and narrow that but one person could work his way along at a time, and that in a stooping position. At the end of this cave we found large quantity of clay, packed very hard, which we pitched into and tried to demolish, but after working away for a couple of hours, and clearing about 12 feet we found the rock terminated there, and that nothing but 'mud' remained. To say we were disgusted, would feebly express our feelings, and we made all haste to leave our position. In our investigation, we found that the floor of the cave seemed hollow, when we began drilling it immediately in front of that 'beautiful small spring' spoken of. We succeeded in breaking through this crust, and found it but half an inch in thickness, and below it the inevitable mud for which Maytown is so justly celebrated. We found, when we had ceased drilling that the spring had entirely disappeared, and that the party who explored it last week could sit down on it without experiencing the same dis

agreeable result that followed their first attempt in that direction. A number of peculiar indentations were discovered in the neighborhood of the spring, which we have since learned was made by the aforesaid party in trying to sit down. Taking it as a whole, the cave is really an interesting object, but not so much so as was at first supposed.

We at length found our way to the surface of the earth, and were pleased to say did not experience any of the disagreeable results which followed our predecessors in their expedition. We reached the mouth of the cave and then saw where the other party had been so befuddled, viz: Maytown was so very small that we had great difficulty finding it, which no doubt, was the case with those adventuresome Maytowners who so gallantly perilled their lives in the cause of science."

References: 1, 2

PEQUEA CHURCH CAVES

Pequea Church Caves (Plate 6) are owned by Jacob N. Rissler, E. Main St., Honeybrook, Pa. The Pequea Church is located in Salisbury Township, 1.4 miles north of White Horse (formerly Pequea) and Pa. Route 340. Three caves may be found on the southwestern side of an abandoned dolomite quarry, 200 yards northwest of the historic old church.

The Pequea Church caves have been closed and opened many times over the years. There is no record of their original discovery during quarrying operations, but dates going back to 1925 are visible on one wall in the second cave.

William Hickok, 4th, described the first and third caves in 1932, but did not enter the second cave because its entrance "was blocked by a dead cow" (Stone, 1932). Bernard Smeltzer reported in 1951 all the caves were buried under quantities of trash (Stone and Mohr, 1953).

Then, in September 1955, Caves No. 2 and 3 were opened again by David and Charles Landis, Jr. and George Hostetter, Jr. These two caves were described and mapped at that time (Smeltzer, B. and Stone, R., 1956). However, J. R. Reich, Jr. recalls that all the caves were again closed in 1960.

In the spring of 1966, the present owner, Jacob Rissler, used a bulldozer to reopen Cave No. 3. Shortly thereafter, in September 1966, Cave No. 2 was dug open again by David Brison, Dale Ibberson and J. R. Reich, Jr.

Cave No. 1—Since this cave has remained closed for over 30 years, it is necessary to quote Hickok's original description of it: "The eastern opening leads downwards at a 30 degree angle for 30 feet where it flattens out and was followed for 60 feet by crawling. Loose blocks in the roof prevented further progress." (Stone, 1932)

Cave No. 2—This is probably the largest of the three caves. It is entered through a small opening at the base of the southwest quarry wall. A steep debris slope leads down into a straight, narrow passage which heads roughly west for 125 feet, averaging 3 feet wide and 10 feet high. A branch passage is encountered 80 feet from the entrance and can be followed southeast for 38 feet. Here the fissure becomes so narrow that only extremely thin persons could proceed further. Smeltzer reports that the entire branch passage is about 65 feet long. (Smeltzer and Stone, 1956)

The entrance to the third cave is 23 feet northwest of the second cave. A three-foot diameter opening brings one to a room 23 feet long by four feet wide and 8 to 10 feet high. At the rear of this room the cave continues west as a high, narrow fissure for 45 feet.

The Pequea Church Caves occur in Cambrian dolomite of the Ledger Formation. The rock surrounding the cave entrances is highly shattered in a brecciated zone with no observable bedding. However, the rock within the caves has a distinctive solid, homogeneous quality.

The caves were formed in the phreatic zone with solution taking place along near-vertical joints. The principal fissure passages of Caves No. 2 and 3 follow the strike bearing almost east-west, whereas the branch fissure in Cave No. 2 follows a joint bearing N74°W. Interesting phreatic ceiling pendants were noticed in Cave No. 2.

All the caves, including Cave No. 1, Hickok tells us, contain quantities of clear white flowstone. One wall in Cave No. 2 is covered with beautiful orange flowstone.

Several long stalactites are visible at the rear end of the branch fissure in the second cave and Hickok reported that the first cave contained "the remnants of some broken stalactites and stalagmites" (Stone, 1932). Be careful with cave minerals. Caves are not "mineral collecting localities" and should be preserved in their natural state.

David N. Brison

References: 20, 21, 22

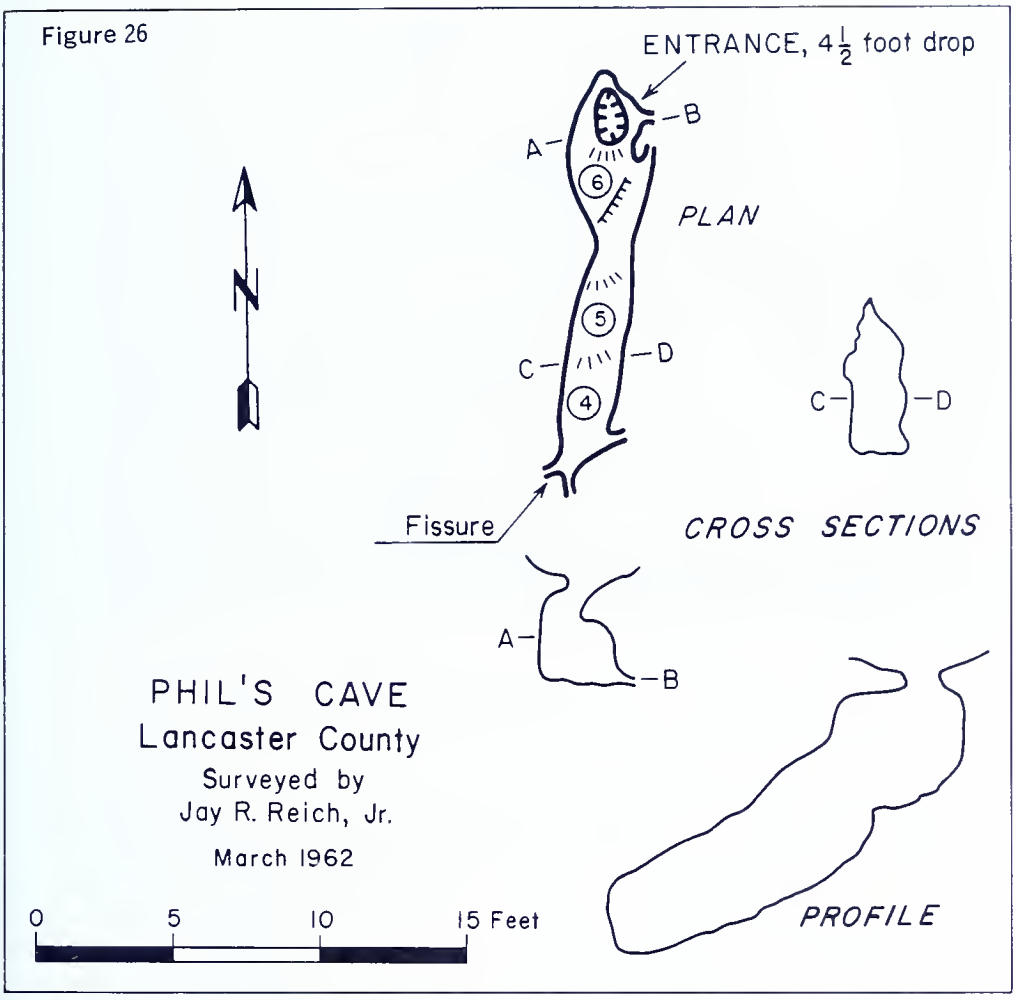
PHIL'S CAVE

A small cave (Figure 26), located by Philip Longenecker of Marietta in 1962, is located near a power transmission line almost a mile west southwest of the square in Maytown.

The entrance is a narrow fissure with a drop of 4.5 feet to a steeply downward leading tunnel 4 feet high, 3 feet wide and 15 feet long. The cave is formed in limestone beds of the Conococheague Group which dip steeply to the south.

J. R. Reich, Jr.

Figure 26



RED HILL CAVE

Red Hill Cave (Plate 7) is owned by Guy S. Hoffman, R. D. 1, Bainbridge, Pa., and Frank H. Strickland, 314 S. Market St., Elizabethtown, Pa.

This historic cave is situated on the north side of Red Hill, a little over half a mile northeast of the square in Bainbridge. From Pa. Route 441, drive east on the Stackstown road. After taking the right fork, continue for 130 yards to the highway shack which sets off to the left. Park here and follow the foot path down through a shady glen for about 100 yards. There, at the base of a large outcropping you will see what is perhaps the most picturesque cave entrance in the county.

Several Indian artifacts were recovered from Red Hill Cave by various persons during the last century. These archaeological investigations were performed by Colonel Henry Haldeman in 1857, by Dr. Tarleton H. Bean of the Smithsonian Institution in 1877, and finally by Mr. F. G.

Galbraith in 1877 and 1883 (anon., 1877). The artifacts collected by Bean and Galbraith were donated by them to the Smithsonian Institution in Washington, D. C. These consist of projectile points, animal bone, pottery shards, shell pendants, and a beautifully preserved bannerstone (spear-thrower weight).

The entrance to Red Hill Cave is 25 feet wide and has an arched ceiling 5 feet high (Figure 27). A tall poplar tree and a large block of limestone conglomerate partially obstruct the entrance. A short, steep slope leads downward to a passage 60 feet long. This corridor gradually decreases in both height and width except at the extreme end of the cave where excavations have created a small head-high chamber. Along the base of the southeast wall at three separate intervals there are low crawlways which range from 2 to 12 feet long.

In April 1877, the *Marietta Register* correspondent, "Tom", reports that the exploring party found the washed-shut mouth of a second, inner chamber "on the south" of the "outer cave" and "only after digging to the depth of 5 feet did . . . (they) discover the top of the arched opening leading to it." He also mentions in his second article that "we have frequent glimpses of corridors and halls beyond, into which we hope soon to carry our torch of investigation." (Anon., 1877).

At present the floor of the cave is a stratified deposit consisting of red sticky clay near the top and grading downward for an estimated ten feet through layers of progressively large cobbles. It is probable that sometime within the last 80 years, as had happened once before in the interval between Haldeman and Bean explorations, a large quantity of dirt and stone has washed into the cave from the elevated fields north of the entrance. Thus the fabled inner room and further reaches of the cave are now sealed and numerous, unsuccessful attempts have been made to reopen them.

Red Hill Cave is developed in basal beds of the New Oxford Formation of Triassic age. These beds, also known as Potomac marble, are a red limestone conglomerate composed largely of limestone pebbles (Stose and Jonas, 1933). The singular red color of the marble and residual soil is responsible for the naming of the hill and the cave.

The cave has been dissolved in the phreatic zone, in beds which dip 25°NW and strike N71°E (magnetic), (Stose and Jonas, 1933). The main cave passage is apparently developed along an inclined joint plane bearing N28°E.

A *Marietta Register* article records in glowing terms that, in 1877, the cave contained "hundreds of beautifully formed stalactites. . . . Many are large, being connected to the ceiling and sides of the cave and have been ages in the forming, which formations continue the whole distance of the

Figure 27 In winter, delicate stalactites and massive stalagmites of ice form in the entrance of Red Hill Cave.

outer cave (seventy feet)" (Anon., 1877). Unfortunately, the persevering vandals and curio-hunters have since succeeded in stripping the cave of all, including the very smallest stalactites. All that remain is a small, dried-up flowstone cascade and a few clusters of "popcorn" or calcite beads.

In the winter there is often a profusion of ice stalactites, stalagmites and columns that form in the east half of the entrance area, and remain until spring (Figure 27).

David N. Brison and J. R. Reich, Jr.

References: 3, 4, 17, 23

REFTON CAVE

Refton Cave (Plate 8) is located one mile northwest of Refton, on property belonging to Howard Miller. The entrance to the cave, along Pequea Creek, is 1400 feet west of a farmhouse. A notarized release must be filed and permission obtained from the owner before entering the cave.

The earliest known reference to Refton Cave is an article that appeared in the *Lancaster Intelligencer* newspaper, circa 1880. The article relates

the experiences of a Mr. Harmon and party as they explored the cave. Investigations by John Price of Franklin and Marshall College's North Museum in 1936 disclosed a new species of planaria found in the cave. The new species was described by Libbie Hyman in 1937 and named after the collector—Speophila pricei. A new species of isopods was also discovered by Price and described by Herbert Levi in 1949, *Caecidotea pricei* (Figure 28). Preliminary ecological investigations of the micro-arthropod population of the cave were performed by the author in 1961.

The entrance to the cave is located in the bottom of a sinkhole, 30 feet in diameter and 20 feet deep. Beneath the gated entrance, a shaft, 4 feet in diameter, drops 25 feet to the top of a 15 foot high mound of debris which has fallen into the entrance shaft. The owner of the cave has installed an aluminum ladder for the convenience of explorers.

The cave consists of one large chamber 85 feet long and 40 to 70 feet wide. The ceiling of this room soars as much as 30 feet from the floor. A small opening off the southwest corner of the chamber was excavated by Bruce Herr in 1959. His diggings revealed a small cell, 10 feet in diameter and 4 feet high. A large pond of water, up to 10 feet deep, occupies the northern half of the chamber. Scuba divers, in 1966, dis-

Figure 28 Specimen of isopod, *Asellidae Caecidotea pricei*, from Refton Cave. The cave is noted for its vast number of speleogenic species.

covered two small underwater pockets on the north wall. (Brison and Ebersole, 1966) Tests have shown the water level in the cave pond to be roughly correspondent to the level of the nearby Pequea Creek. The rising and falling of water levels in the cave lags a day or two behind the corresponding rise and fall of water levels in Pequea Creek. Obviously, no opening of any size exists between the cave and the creek, water is traveling back and forth through very small fissures and pores in the rock.

Refton cave contains, within the pond, isopods, amphibods, and planaria. The air-bound portions of the cave abound in all varieties of the Arthropod phylum: spiders, mosquitoes, and select species of the Collembola family can be found by the hundreds.

Refton cave is developed along a fault zone in the anticlinorium formed north of the Martic Line. The fault traverses east-west through the entrance area; the downthrown side of the fault is to the north, toward the main cave area. The cave was excavated in dolomite of the Vintage Formation, primarily by water entering the fault zone and moving downward to the contact between the Vintage dolomite and Antietam schist. The downward movement of water was stopped by the relatively impermeable schist and was forced along the schist-dolomite contact to form the cave. Southward development of the cave was prevented by the insoluble upthrust schist.

Major development of the cave has taken place under the water table, i.e., in the phreatic zone. Cave development is still occurring in the area of the pond, the surface of which represents the free-surface local water table. Vadose modification of the cave took place mostly along the fault zone, enlarging primitive phreatic fissures into the entrance shaft and the chimney or dome 30 feet to the east.

Previous reports that the cave was excavated in Ordovician marble resting on schist were inconsistent in logic. It is highly improbable that an Ordovician marble could rest on a lower Cambrian schist in view of the faulting at this locality. It is more improbable that a chamber of this size could have ever developed in the marble; homogeneous, pure limestones of this type are notoriously cave-barren in Lancaster County.

In view of the inconsistencies, the cave-bearing beds are believed to be dolomite of the lower Vintage Formation, a light colored schistose dolomite, conformably overlying the Antietam.

J. R. Reich, Jr.

References: 7, 12, 14, 18

REYNOLDS CAVE

On the west branch of Octoraro Creek about 3.5 miles southeast of Quarryville on the property of Carl Reynolds, a cave 38 feet long,

extending east in mica schist, was found by Charles Landis, Jr., an mapped March 12, 1955 (Figure 29). The passage is 5 to 9 feet wide bends to the left and ends in small loose breakdown.

Bernard L. Smeltzer

Reference: 20

RINEER CAVE

One mile north of Strasburg, on property of Peter Rineer, there ar several, abandoned, junk-filled quarries 200 yards southwest of the roa Pa. Route 896. Rineer Cave (Plate 9) is situated in the northwesternmos quarry, the one nearest the road. The cave can be best approached b traveling northwest from Strasburg on Pa. Route 896 for a distance o exactly 1.1 miles. Here, a lane from the left (southwest) intersects wit the main road. The quarries and cave are located 200 yards down th lane.

The entrance to Rineer Cave is a trash-strewn pit, eight feet deep. low opening, framed by the discarded steel rim of a wagon wheel, lea eastward into a room, 30 feet long, 30 feet wide, and averaging fou feet high. Large breakdown blocks litter the floor of the room, probabl a result of blasting in the quarry overhead. It seems remarkable that th blasting involved in the quarry operation did not totally collapse th room. The distance between the roof of the entrance chamber and th floor of the quarry can be no more than 8 feet. A ceiling slot, three o four feet deep, starts at the entrance and trends due east. A paralle ceiling slot occurs in the northern half of the room, and the two slo combine to form a dome situated in the eastern extremity of the entran room.

In the northwestern corner of the entrance chamber, there is a narro pit, 12 feet deep, which leads to the remainder of the cave. The pit dro 5 feet to a point where wedged boulders have created a corkscrew-lik opening. Here, the explorer must squirm between the pit wall an boulders, down an additional 7 feet, to the lower level of the cave. At th base of the pit, the corridors trend in 2 directions; the eastward trending passage, 25 feet long, 3 feet wide, and up to 5 feet high, co tains very attractive white stalactites and a shelf formed by some solutio resistant beds within the limestone. The westwardly trending passag 2 to 5 feet wide and one foot high, extends 35 feet through severe brea down to a small room.

This tiny chamber contains one of the most unusual geologic form tions that I have ever seen in a cave. The ceiling of this small room composed entirely of eroded calcite. Whether the calcite ceiling is

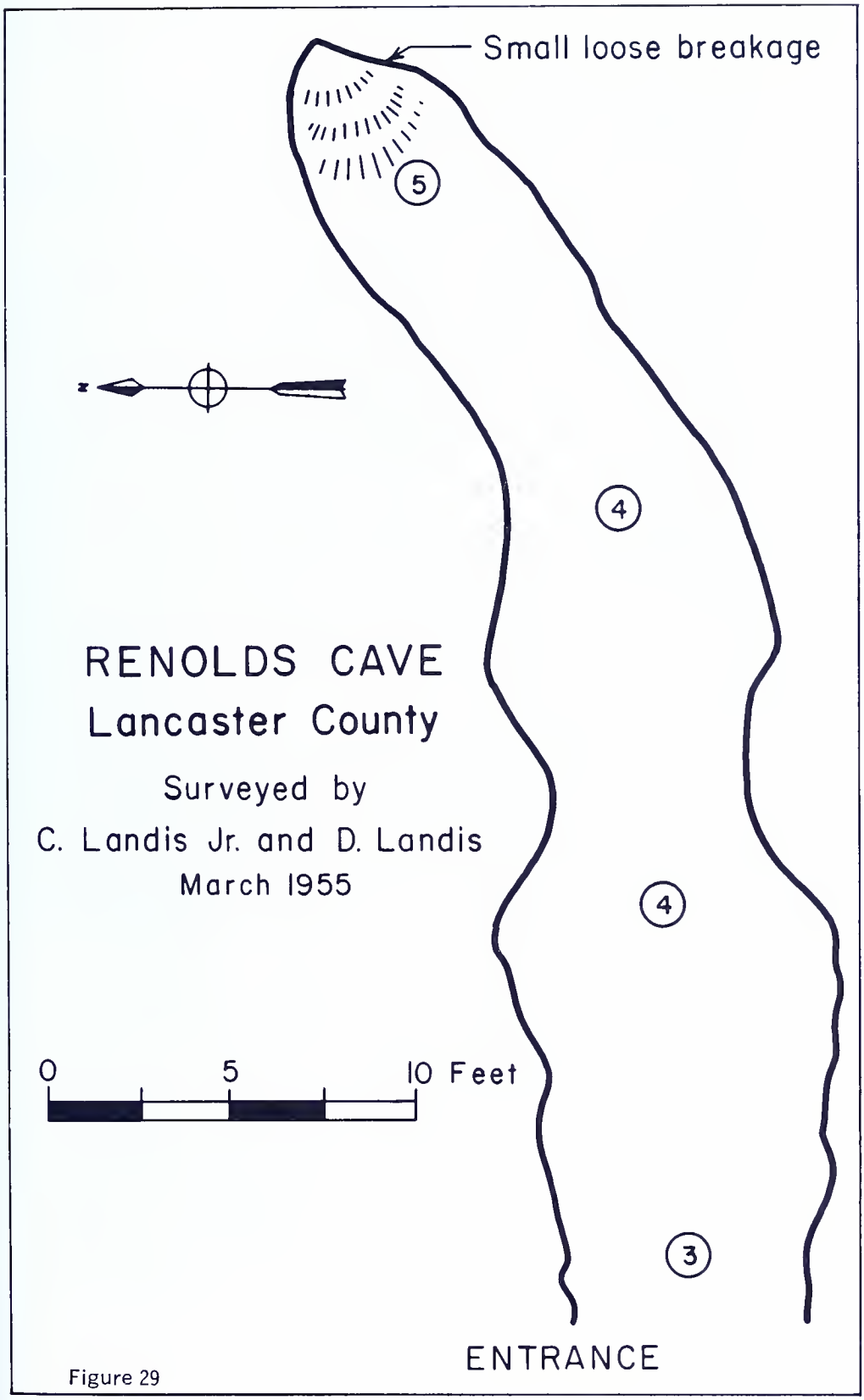

Small loose breakage
5
4
4
3
RENOLDS CAVE
Lancaster County
Surveyed by
C. Landis Jr. and D. Landis
March 1955
0
5
10 Feet
ENTRANCE

Figure 29

mineral lens in the dolomite or a cave dripstone deposit subsequently undermined by a stream is unknown. The surface of the ceiling is clean and quite white which makes it difficult to believe that it was dripstone deposited on a clay bank; otherwise the ceiling retains all the characteristics of cave deposited calcite.

On the north side of the calcite-roofed room, a crawlway trends northward 20 feet to a fissure passage. This narrow fissure extends 20 feet east and west from the crawlway. The fissure becomes too narrow to the west and too low to the east for further progress.

South of Lancaster, limestone of the Conestoga Formation becomes more intensely folded and forms an anticlinorium about 9 miles wide. The Conestoga limestone is eroded away throughout most of the anticlinorium revealing older rocks upthrust by subordinate anticlines. The northernmost of these smaller upfolds exposes dolomite of the Vintage Formation directly underlying Conestoga limestone. The Conestoga Formation occurs both north and south, and only a small strip of the Vintage is exposed at the apex of this eroded anticline. It is within this narrow anticlinal fold of Vintage dolomite that Rineer Cave and its neighbor, Strasburg Cave are developed.

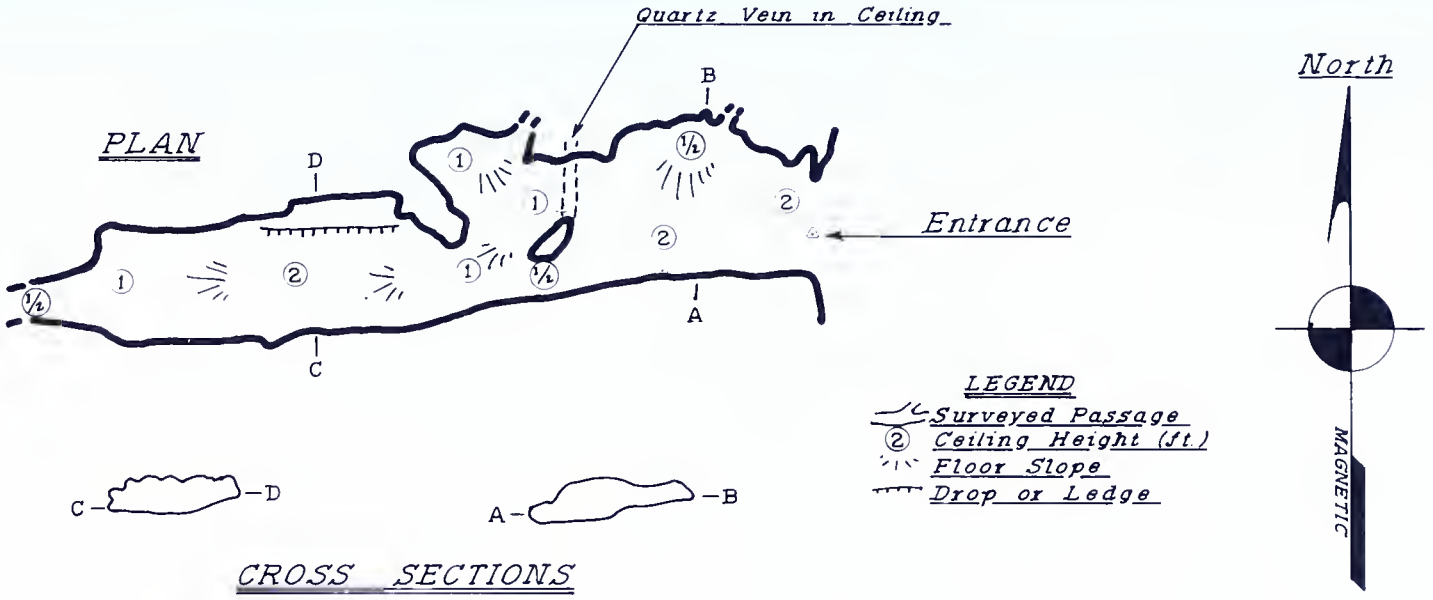
Rocks that have been subjected to severe folding are obviously highly fractured. The numerous open joints and fracture planes allow easy circulation of acid-laden ground water that gradually dissolves limestones and dolomites, forming caves.

Rineer Cave has evolved in such a situation, in Vintage dolomite, at the crest of the anticline, where bedding is nearly horizontal and fracturing most severe. Development of the cave has occurred along bedding planes in a direction parallel to the east-west strike. Long slots in the ceiling of the entrance room and the fissure passage in the northwestern part of the cave appear to be strike-oriented joint planes enlarged by solution.

J. R. Reich, Jr.

SAINT MARY'S CHURCH CAVE

In a small, abandoned limestone quarry, 0.5 mile northeast of Safe Harbor Village, there is a 40-foot long crawlway cave (Figure 30). It may be reached by driving east of Safe Harbor on Pa. Route 922 for exactly 0.5 mile on a dirt road for 200 yards to the stark ruins of St. Mary's Roman Catholic Church which can be seen in the woods on the right. From here the quarry is across a cultivated field about 300 yards southeast.



SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania

Drawn by J. R. Reich, Jr. from a survey by D. Brison & A. Schober

ST. MARY'S CHURCH CAVE

Safe Harbor, Lancaster County, Pennsylvania

March 19, 1967

Figure 30

A-17

The quarry is in blue crystalline limestone of the Conestoga Formation and reportedly stone from it was used by early Irish settlers over a century ago in construction of the church.

The low entrance to the cave lies exposed at the base of the west quarry wall. Essentially the passage trends due west and slightly downward for 40 feet, averaging 6 feet wide and one to 2 feet high.

Small solution pockets in the walls and ceiling indicate a completely phreatic origin. Thirteen feet from the entrance a broad quartz vein intersects the passage causing reduced ceiling height at that point.

David N. Brison

SEIBEL CAVE

A cave on the Irvin Seibel farm is located along Little Chickies Creek, 1.5 miles due north of Mount Joy (Figure 31). On the east side of an arched opening, there is a six-foot crawlway down the bedding plane to a keyhole. Here a low rubble-filled passage follows upward, parallel to the strike for nine feet. The cave occurs in limestone of the Beekmantown Formation which here strikes N61°W and dips 56°NE. This may not be a natural cave; more likely the splitting and displacement of the beds resulted from the force of blasting during a minor quarrying operation.

A phreatic tube, 5 feet long, may be found at creek level, 1000 feet to the northwest.

David N. Brison

SHEEP ROCK SHELTER CAVE

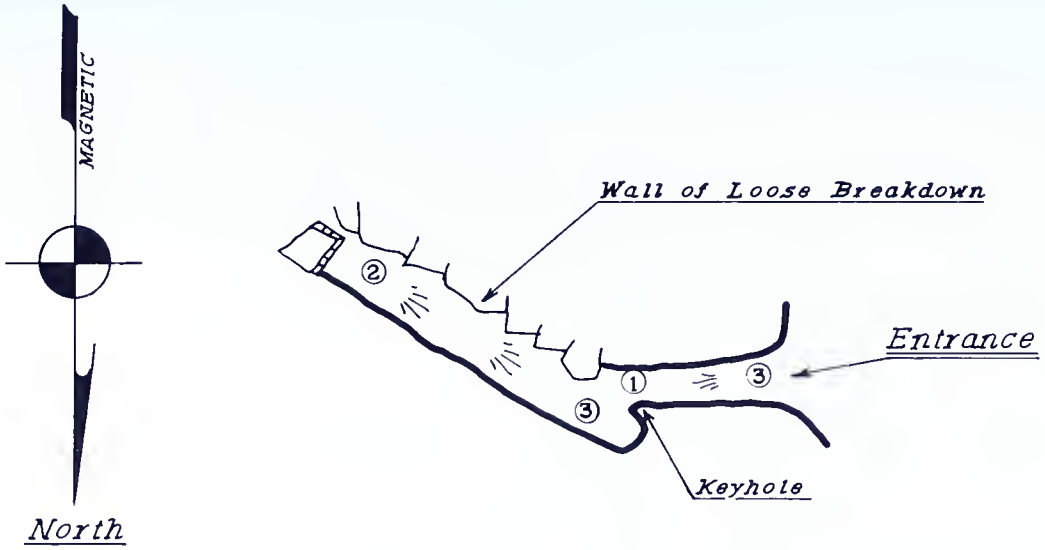
This small shelter cave is located 3.5 miles south of Washington Boro and 0.5 mile north of Star Rock. It is roughly 100 feet below the crest of the steep east flank of the Susquehanna River Gap.

A low flat slot, 20 feet square and 1 to 2 feet high, occurs beneath a large rectangular block of Wissahickon albite-chlorite schist. The cavity has apparently resulted from mechanical erosion in a zone of weakness prior to uplift and subsequent river entrenchment.

David N. Brison

SILVER HILL BOULDER CAVE

The 920 foot eminence of Silver Hill is located in a wilderness area at the eastern end of Brecknock township, three miles southeast of Bowmansville and 3.5 miles north of Churchtown. The boulder cave is 0.5 mile northwest of Silver Hill at an elevation of 740 feet (Figure 32).



SPELEO-RESEARCH ASSOCIATES

Marietta, Pennsylvania

Drawn by J.R. Reich, Jr. from a survey by D. Brison

SEIBEL CAVE

Mount Joy, Lancaster County, Penna.

October 18, 1966

Figure 31

A-11

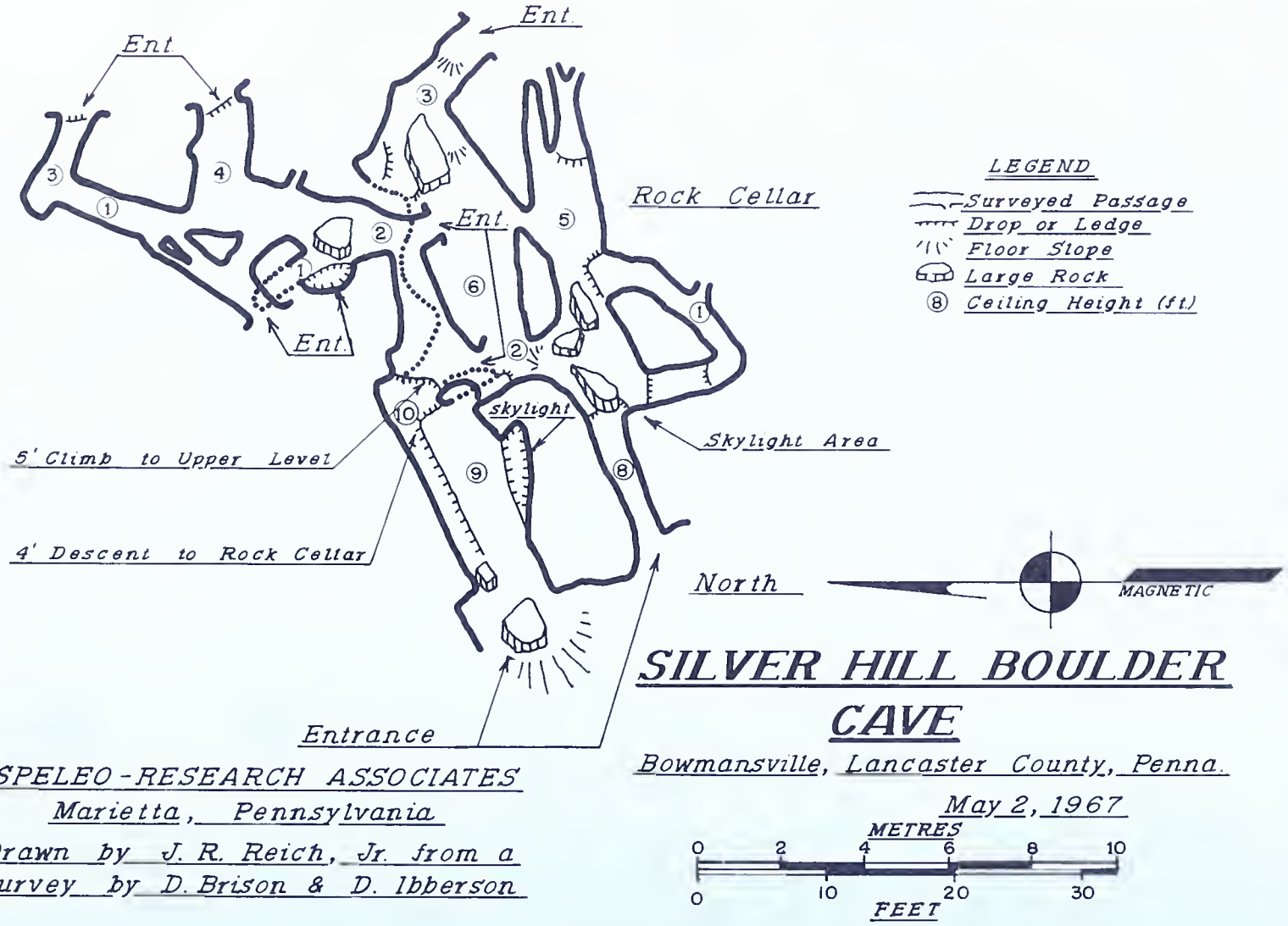


Figure 32

A-16

It may be reached by driving north out of Churchtown for 1.8 miles. Continue north from the left fork for 0.9 mile, turn left, and drive west for 1.7 miles. Turn right here, cross the Pennsylvania Turnpike, and turn right again. Follow the paved road for 0.5 mile to where it becomes a rough jeep trail. Proceed north by taking all left forks and after 0.3 mile you will see the huge boulders under which the cave occurs.

In recording the history of Brecknock Township for the *Lancaster Daily New Era,* August 4, 1881, John B. Good relates that it was "well known" that here at the cave which was then called "The Rock Cellar," Revolutionary War draftees, "preferring the life of a hermit to the dangers of the Continental army in the tented field, found a comparatively safe retreat from the pursuit of the provost-marshall's posse".

This extensive boulder cave consists of various connecting passages and rooms beneath a large assemblage of rounded diabase masses. There are as many as 11 entrances or possible ways into the cave. Because of this, daylight penetrates into nearly every passage with the exception of the Rock Cellar Room.

The principal west entrance is more than head high and opens into a skylit room, 6 feet wide, 18 feet long and up to 9 feet high. At the rear of this room, a 5-foot climb leads to the upper and north section. Here, if one so desires, it is possible either to crawl through a total of 60 feet of passage, or to exit at any one of six places.

Returning to the rear of the main-entrance room, one can also descend four feet through a tight slit and enter the historic "Rock Cellar". This room is formed by one enormous diabase block leaning against another which causes it to resemble the interior of a lopsided tent. It is 23 feet long, 3 to 6 feet high and up to 8 feet wide at floor level. The Rock Cellar can be entered more easily from the outside via low openings at the southwest and southeast corners of the room.

The secondary west entrance to the cave is 10 feet south of the main entrance and at a lower level. A walking passage, 14 feet long, brings one to a large skylit area. On the left is the southwest entrance to the Rock Cellar. Straight ahead there is a five-foot high chamber and on the right is a crawlway which loops around and joins that chamber.

The formative processes involved here are very similar to those described for other Lancaster County boulder caves occurring in the Triassic diabase. See especially Devil's Hole Boulder Caves and Governor's Stables.

David N. Brison

References: 8, 22

SNYDER CAVES

On the Harry Snyder farm northeast of Hinkletown and along the south bank of Muddy Creek, 0.5 mile north of its confluence with the Conestoga Creek, there are several small caves. These mostly consist of low, wide phreatic undercuts right at creek level. On the brink of a ten-foot high bank, a small natural bridge may be noticed. Three hundred yards upstream, at the base of a high cliff, there is a phreatic tube, 10 feet long. All the caves occur in limestone of the Beekmantown Group of Ordovician age.

David N. Brison

STACKSTOWN CAVE

Stackstown Cave is owned by J. Richard Nissley, Landisville, Pa. It is a 20 foot long solution cave in limestone of the Conococheague Group, located 700 feet north of the bridge at Stackstown. It is at the base of a low cliff, 12 feet northwest of the road which parallels the Conoy Creek. Recently the entrance has been completely buried under an accumulation of trash, earth and fill.

The cave consists of a low crawlway which leads to a space, 5 feet wide and 4 feet high. Here two parallel crawlways continue southwest for only 6 feet. The passages are developed along the strike in beds dipping steeply to the north. Some flowstone and stalactites are present. Do not disturb the cave minerals.

David N. Brison

STRASBURG CAVE

On the Aaron Lantz farm, 0.5 mile north of Strasburg at the intersection of dirt and macadam roads, there is an old quarry in limestone of the Conestoga Formation. Over the mouth of the cave a fault separates beds dipping southeast and northwest. A triangular opening about 2 feet high and wide at the base of the quarry wall connects to a tiny passage, barely traversable, heading S16°E. Fourteen feet from the entrance is a room 12 by 9 feet and 4 feet high. A low crawlway on the west side of the room leads down a slope 6 feet to a pool of water. The floor slopes into the pool of very clear water and one can see a submerged chamber opening at the base of the slope. The passage here is 8 to 10 feet high (Figure 33).

At the south end of the room a passage 2 to 3 feet high continues S25°W for 13 feet through breakdown. This cave was mapped by Charles and David Landis.

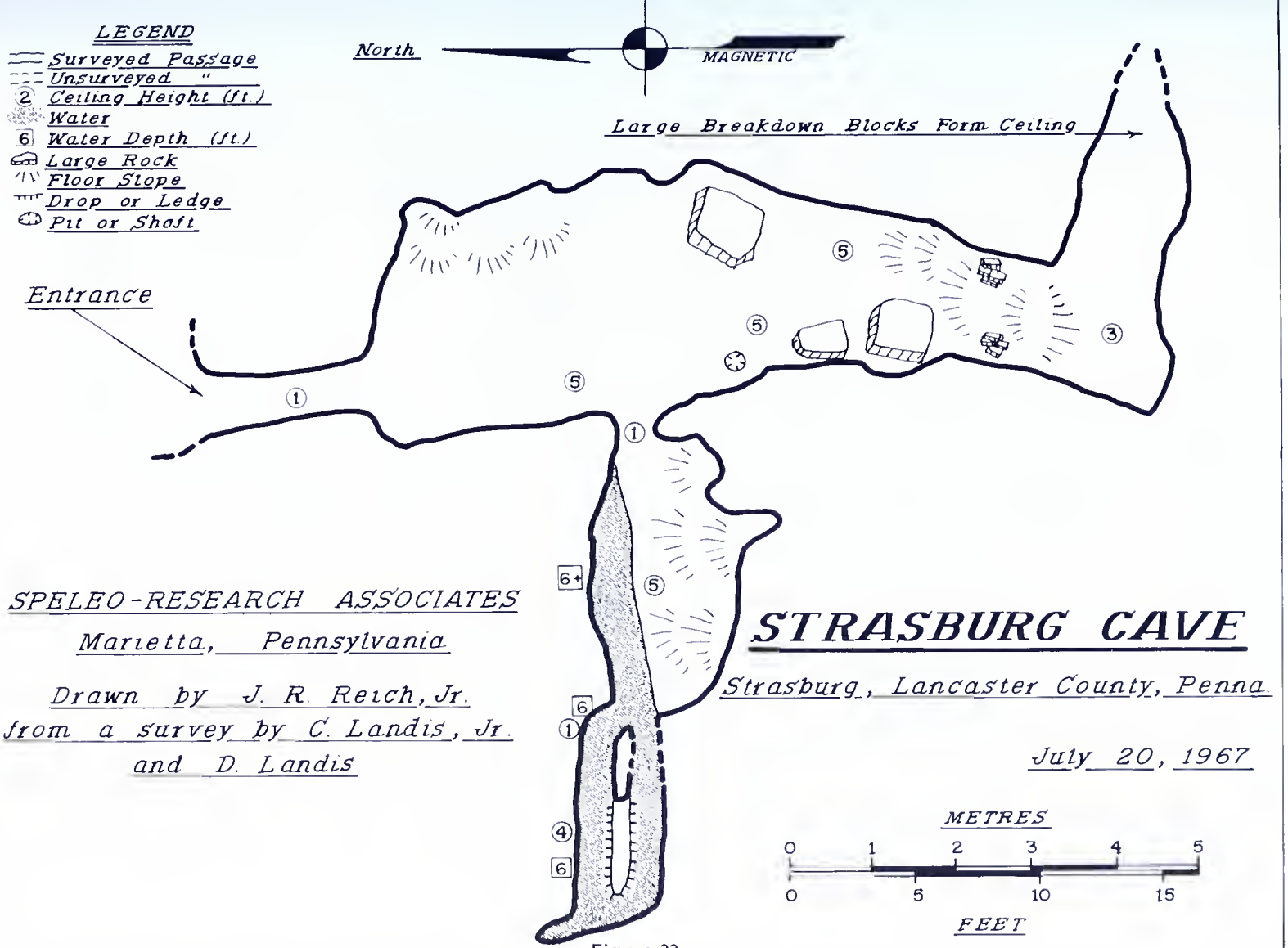

LEGEND
Surveyed Passage
Unsurveyed "
2 Ceiling Height (ft.)
Water
6 Water Depth (ft.)
Large Rock
Floor Slope
Drop or Ledge
Pit or Shaft
North
MAGNETIC
Large Breakdown Blocks Form Ceiling
Entrance
SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania
Drawn by J. R. Reich, Jr.
from a survey by C. Landis, Jr.
and D. Landis
STRASBURG CAVE
Strasburg, Lancaster County, Penna.
July 20, 1967
METRES
0 1 2 3 4 5
0 5 10 15
FEET

Figure 33

It is reported that years ago local farmers blasted shut a large underground passage 200 yards northeast of Strasburg Cave to keep young boys away from a large lake. This may be true, for the breakdown at the rear of Strasburg Cave looks dangerously recent.

Bernard L. Smeltzer

Reference: 20

UTILITY CAVE

Utility Cave (Figure 34) is located within the fenced-off enclosure of the Pennsylvania Power and Light Company substation in Engleside, one mile south of Penn Square in Lancaster and along Pa. Route 324 and Conestoga Creek. The entrance to the cave is found on the north face of a now filled quarry. Honeysuckle vines cover the entrance and make it somewhat difficult to locate.

Mention of a cave at this location was first made by B. L. Miller in his book *Limestones of Pennsylvania* (1934, p. 468). He merely reported the existence of the cave and made no attempt at description.

The entrance is 2 feet wide, 3 feet high, and 4 feet up from the present quarry floor. A tunnel 5 feet long leads to a small chamber 10 feet in diameter and up to 4 feet high. A trench cuts down through the rock floor of this chamber.

Utility Cave is excavated in gently east dipping beds of Conestoga limestone. The floor plan of the cave is largely the result of phreatic solution of a non-resistant bed of limestone. The trench and keyhole-shaped entrance are due to the action of vadose water cutting downward through the rock floor of the primitive cave.

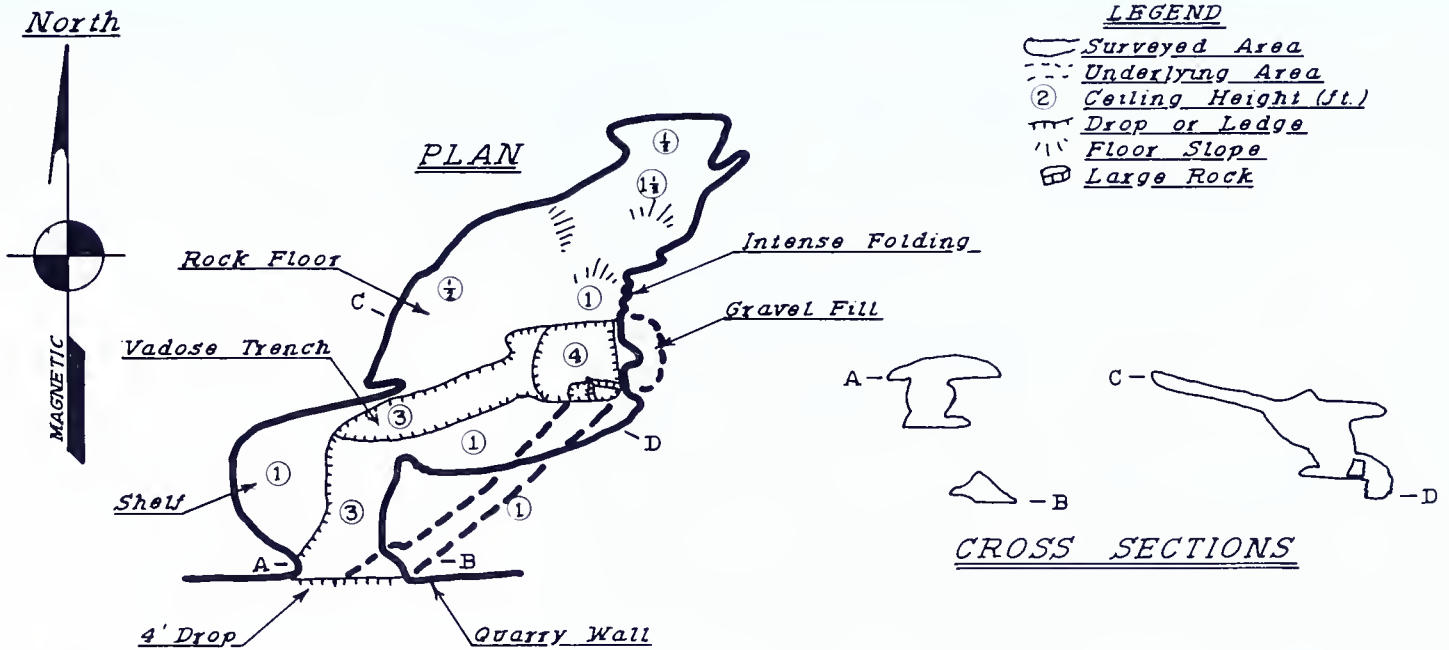
J. R. Reich, Jr.

Reference: 16

WIND CAVE (COLD CAVE)

To find Wind Cave (Plate 10), proceed southward on the road through Pequea 0.75 mile from the end of Pa. Route 324 in Pequea. Here a railroad access road on the right leads westward toward the Susquehanna River. A short distance down this road, there is a springhouse on the south side. A trail alongside the springhouse leads up to the mountain and south approximately 0.5 mile to the cave entrance.

Wind Cave, high on the eastern bank of the Susquehanna River in Lancaster County, Pa., is not a spectacular cave but is of interest because of its formation. It was not formed by solution but is one of the largest



SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania

Drawn by J. R. Reich, Jr. from a survey by D. Brison and J. Reich

UTILITY CAVE

Engleside, Lancaster Co., Pennsylvania

March 16, 1967

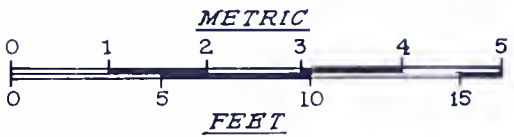


Figure 34

A-21

tectonic, or fault, caves in the eastern United States, perhaps in the country.

A summer visit to the cave easily explains both the name "Wind" and the local appellation of "Cold". Throughout the main passageways a strong entrance-blowing air current is apparent and the temperature is decidedly cooler than that of other Pennsylvania caves (the mean temperatures for Pennsylvania caves range from 50° to 57° F.). In May, 1962 a careful check determined that the temperature in all accessible portions of the cave was 38°F. At no time were we able to reach any room or passageway where there was any discernible variation in the temperature and very little in air currents. This is partially explained by the fact that most of the passages do not end in the usual sense but narrow to untraversable crevices—sometimes quite high—that continue for unknown distances.

In addition to the unusual temperature, another warm weather condition was encountered. All rooms and passageways entered had considerable condensation and thousands of drops of water hung from the roof and every protruding rock. The fact that they sparkled like proverbial "jewels" in our lights did nothing to dispel their cold wetness when they fell unexpectedly down one's neck or splashed unconcernedly on the camera lens just as a picture was being taken.

During colder months the cave is quite dry, evidence of water—undoubtedly surface water—being found at only two widely separated points. The winter temperature may also be cooler than that of the normal Pennsylvania cave. Although no accurate winter readings have been taken by the author, thick sheets of ice are often found on the northeast wall at the inner end of the now-destroyed wooden bridge.

The two entrances to the cave are about 75 feet apart (Figure 35). The one used most is an almost vertical crack in the rock, 8 feet high and 2 to 3 feet wide. The floor gradually descends until the flat ceiling is 15 to 25 feet high as the passageway goes straight under the hill for at least 150 feet. The fractured rock faces that are usually characteristic of a fault are much in evidence along this passage. There is little breakdown and the only fill is debris carried in by the wind and casual spelunkers.

Large fallen blocks dot the passageway here and there and some climbing is required but at 175 to 200 feet—depending on one's girth—it becomes too narrow for further progress. Despite a ceiling height of 20 feet, this is the extent of exploration in this section.

Seventy-five feet from the entrance and near a small opening to the surface, 28 feet above, a cross joint makes an abrupt right angle passageway to the south and drops down to a lower level, and the largest part

Figure 35 Typical of Wind Cave is the fissure-shaped passage in the walls of the Susquehanna Gorge. Dave Brison in the main entrance.

of the cave, consisting of two or more passageways that parallel the first one. One of these passages connects to the second entrance, and at one spot was once floored by a crude wooden bridge, which spanned a 6 to 8 foot deep chasm, but time and the passage of local explorers have just about ended its usefulness. Near this area a side passageway was blasted open by B. Hivner in 1956 and about 100 more feet of cave was found. It consists of a high and narrow canyon-like passageway—good for chimney practicing—and lower stoopways similar to other parts of the cave. Because it is a triffle more difficult to enter this section it is seldom visited by the many local spelunkers and, indeed, most do not seem to be aware of its existence.

In August 1962, another room was discovered in the south portion of the cave. It is entered from the north through breakdown, and from the south through a tight crawlway. The room consists of a chamber 12 feet wide, 20 feet long and up to 17 feet high. A canyon-like passage on the south side connects to the previously mentioned crawlway.

In other parts of the cave, dropped blocks sometimes make a short crawl necessary but progress is easy as compared with most "wild" caves. At one spot a 10 foot drop to a lower level is easily negotiated. It leads to another cross joint varying from 10 to 15 feet in height with numerous offsets and large breakdown. Most of the leads end in choked tunnels or at those frustrating high and very narrow crevices that are too small for even the Thin Man to enter. Here and there on the floor are large blocks of what seem to be quartz.

The cave is easy to enter, reasonably safe and, except except for short drops here and there, easily climbed by the inexperienced. Some potentially dangerous breakdown is found in passageways off the lower level but this is a threat only to those unfamiliar with good caving technique. The possibilities for finding more cave are good if one wants to invest the time necessary to enlarge the narrow crevices.

Although there seems to be some differences among authorities as to the correct designation for Wind Cave, William B. White in the *1959 Speleo Digest,* p. 2-2, suggests that "tectonic" is correct and quotes deBellard as follows: "Tectonic caves formed by actual movement of masses of bedrock. Thus they can occur in any type of rock, but are usually associated with hard, insoluble rocks, because they are easily distinguished from caves of other origin." The type of tectonic activity is not specified. It might be slippage along bedding planes, parting because of intense folding, or a sudden splitting due to faulting.

Tectonic caves are usually small. Other Pennsylvania examples are Dravosburg Cave, Blessing Mountain Wells, and Panther Cave. With more than a thousand feet of passageways, Wind Cave is by far the largest known in the state. Some so-called tectonic "caves" are not actual caves in the usual sense but are simply deep rifts and chasms which are open at the top and which may or may not have small portions completely roofed. All of Wind Cave is entirely underground.

The walls of the Susquehanna gorge at Wind Cave are formed in pre-Cambrian(?) Wissahickon muscovite, chlorite, quartz schist, an insoluble rock composed largely of mica flakes. When these walls settled and split many thousands of years ago, 3 or more systems of nearly vertical joints opened, forming an extensive system of passageways.

"Two or more of the main joints have a N50°W course, another is at a right angle to these, and the third set of joints is nearly north-south" (Stone, 1953).

There are no speleothems in Wind Cave. The walls and ceilings are rough throughout and there is no evidence of solution. The rock seems to be the same type throughout. There is no fill as commonly associated with solution caves. Apparently almost all of the relatively small amount of breakdown occurred during the formation of the cave when the walls were split apart. Mica flakes are prominent throughout and, during the summer months when condensation causes water drops which "wash" the flakes here and there, they are more plainly seen.

Our old friend the Allegheny cave rat, *Neotoma magister,* is still nesting in certain areas as he has done by many years. Commenting on the inquisitiveness of this rodent, Charles Mohr once wrote: "In Wind Cave I watched 40 persons file by a ledge where a cave rat sat, seemingly fascinated by the unprecedented parade." The rats are still there and are as inquisitive as ever but by now seem to be much less fascinated by spelunkers.

As far as the author knows, no other cave fauna—including bats—have ever been reported from Wind Cave. Is this absence of life due to the formation of the cave or to its temperature? If either is the case this would be worth a careful study on the part of some enterprising speleologist.

As far as that goes, very little study has ever been done in this country on tectonic caves. Speleologists seem to have shown so little interest in them that all the fine points of detail which give rise to controversy have hardly been touched. This makes them, indeed, a fertile field for future speleological study.

George F. Jackson
with revisions by
J. R. Reich, Jr.

Reference: 22

WOLF ROCK CAVE

This cave was briefly described in the MAR Bulletin No. 5 (1960) as a closed shelter occurring in quartzite and located somewhere within the Quarryville 15-minute quadrangle map. Attempts at rediscovering it in the Wolf Rock Run area, 0.5 mile northwest of Nickel Mines, were unsuccessful.

WYETH CAVE

Wyeth Cave (Plate 11) is owned by Wyeth Laboratories, Inc., Marietta Pa. It has the distinction of possessing the most unique entrance situation in Lancaster County or for that matter anywhere in Pennsylvania.

The cave is located directly beneath a newly-constructed warehouse at Wyeth Labs and can be entered only by passing through two manmade hatchways. The first is a specially-constructed steel trap-door located roughly in the center of the warehouse. This leads to a three-foot-high sub-floor area. At the northern end of this low space there is an opening into a 12-foot-deep concrete catch basin. An 18-inch tile pipe set into the west wall of the catch basin provides the actual entryway to the cave itself.

In 1957, while grading for a parking lot, engineers uncovered a sinkhole which opened into the top of a natural shaft in bedrock. It was decided to excavate this sinkhole and build a concrete catch basin which would rest on the bedrock at the top of the shaft and thereby utilize the cave below for the disposal of runoff and condenser water.

A cover grate placed over the catch basin allowed the rain runoff from the paved parking lot to enter the cave. A pipe leading to the catch basin was constructed to transport into the cave not only the runoff rain waters from approximately 50,000 square feet of building-roof but also 25 to 50 thousand gallons of cooling water per day from the Lab's refrigeration and distillation condensers. This waste water was poured into the cave for 8 to 24 hours per day over a period of 8 years. The temperature of this water varied between ambient and 180° F.

The condenser waste water was in early 1965 diverted and disposed of elsewhere but the lack of air movement in the cave plus the residual heat stored within the mud floor were responsible for an incredibly unnatural cave air temperature. In September 1965, when the cave was entered for the first time by J. Reich and D. Brison the cave air temperature was measured and found to be 82°F. One year later, in November 1966, the air temperature had decreased to 72°F.

On the basis of a survey by Reich and Brison, conducted at the request of the Wyeth management, the engineers decided that the floor of the new warehouse had to be constructed to span the area immediately overlying the cave by means of grade beams. This created the sub-floor space mentioned above.

In the fall of 1966 when the warehouse was near completion the underside of the floor spanning the cave was coated with a water proofing material. The powerfully acrid smell of this material has since completely permeated the cave atmosphere below. This odor, in addition to the unnatural heat, makes the exploration of this cave extremely unpleasant if not wholly inadvisable.

The 18-inch pipe in the west wall of the catch basin is three feet long and leads to the top of a 12-foot drop into the entrance room. This drop is best negotiated by means of a cable ladder. The entrance room is roughly 10 feet square with a steeply sloping bedrock floor. A five-foot

deep bedrock canyon traverses the entire southern end of the room. At the western, lower end of this canyon an impassable solution tube carried away all the water entering the cave.

At the southeast end of this room a five-foot-high slot leads to the Great Mud Room, one of the largest cave rooms in Lancaster County. This room could also be entered via a short one-foot-high crawl at the southwest end of the entrance room.

The Great Mud Room is approximately 25 feet in diameter and up to 25 feet high. The entire floor consists of wet, slippery mud generally sloping down to the south. A mud ledge running along the west wall of the room, from one to two feet below the ceiling, probably represents the only surviving original cave floor. For it is quite clear that the waste and runoff waters dumped into the cave over the years transported great amounts of cave mud and clay further down into lower cave passages. Gradual collapse of portions of this mud ledge still continues.

A sinuous canyon, starting at the northwest end of the Great Mud Room and ending at the opening to a crawlway at the southern end of the room, is up to 12 feet deep and very steep-sided. This canyon was formed by the subsurface tunneling of the clastic floor deposits by the inflowing waste waters, followed by the collapse of the overlying deposits. The main source for this undermining water was a solution tube entering the bottom of the canyon roughly in the middle of the room. This tube is one to three feet high and heads southwest for eight feet where it turns to the northwest and becomes impassable. The impassable tube at the lower end of the entrance room canyon probably connects with it and transported water to it during high runoff periods.

At the southern end of the Great Mud Room, a low crawlway heads south for 5 feet and intersects the 10-foot-long terminal crawlway. This crawlway represents the lowest portion of the cave and is the only apparent exit for the transported cave sediments. A 25-foot-high chimney fissure penetrates the ceiling at the south end of the Great Mud Room. At the top it ends in surface collapse.

Wyeth Cave occurs in Cambrian dolomite of the Vintage Formation. The beds exposed in the cave are characteristically coarse, dark-blue dolomite with a wavy, knotty appearance due to the argillaceous impurities and differential weathering.

The cave is situated in the south limb of an anticline. An east-west bearing fault roughly following the axial plane of this anticline occurs just north of the entrance.

The majority of the cave developed along the bedding plane which dips 30°S. Some minor features developed parallel to strike, for example, the entrance modification is evident in the entrance room canyon and in the slot connecting with the Great Mud Room. The abundant clay and

mud sediments in the cave are probably due to the insoluble argillaceou impurities remaining after phreatic solution.

David N. Brison

MONTGOMERY COUNTY

CONSHOHOCKEN CAVE

A cave in a cut along the Pennsylvania Railroad between Con shohocken and Norristown was reported by U. E. Lutz of the Philadel phia Grotto of N. S. S. on December 1, 1955: "The entrance is a hol three feet high and six feet wide in the east wall of a cut, seven feet abov track level. The cave consists of a more or less level crawlway in limeston beds, strike roughly NE-SW, dip approximately 45° SE. It extends int the rock almost due east, becomes gradually smaller, veers slightly t right at 15 feet and at 35 feet slightly to the left. We found it passabl for a measured distance of 56 feet, where the ceiling is so low that furthe progress is practically impossible. Here one can see about eight fee straight ahead to where there seems to be a dip in the floor. Except a the entrance the floor is dry clay. There are no side passages and n formations."

Across the Schuylkill River from Hamilton Paper Company plant a Miquon, a triangular opening seven feet high and ten feet wide in th wall of an old quarry appears to be an old underground mine workin rather than a cave, according to Mr. Lutz.

Reference: 20

PORT KENNEDY CAVES

At Port Kennedy on the Schuylkill River just below Valley Forg there was formerly a cave which is mentioned in the geologic literatur as a place of much interest because of the remains of extinct animal found in it. Cope, Mercer, Leidy, and others have described four specie of giant sloth, two horses, a tapir, three peccaries, a mastodon, five cat including two species of saber tooth and a bear larger than a grizzly, i a total of 54 mammals, 41 of which are now extinct. Any of the cave tha remains has been filled with the waste lime sludge from the plant of th Ehret Magnesia Manufacturing Company. (Fowler, Parker)

Reference: 22

SCHUYLKILL CAVE

The cave is four miles east of the Conshohocken exit of the Schuylki Expressway and 100 feet west of the road. It is a triangular shape

opening about six feet high in the Wissachickon schist. The cave is 15 feet long and about 15 feet deep.

SWEDELAND CAVE

The cave is one mile north-northeast of the Gulph Mills exit of the Schuylkill Expressway.

In the spring of 1967, the water in a small pond, 200 feet across, drained into a pit which opened up on one side of the pond. This pit, now in a mud flat, is seven feet deep. At its base is a passage two feet high and wide which slopes downward to the west for 15 feet. Beyond this, the passage is one foot wide and three feet high and continues west for another 15 feet. The passage is then blocked by pieces of wood which have been washed in.

VALLEY FORGE CAVES

The caves are in the base of a large sink 180 feet across and 30 feet deep 0.3 miles north of the memorial arch in Valley Forge State Park.

Cave No. 1 is a pit 20 feet deep. It is quite unstable and has not been entered.

Cave No. 2 is 20 feet from No. 1 and is a two foot high passage extending southeast for 40 feet to a rock fill.

OTHER CAVES

Two small caves were found on the edge of a partially-filled quarry in Cambrian limestone a mile southwest of Port Kennedy. One is a "storm sewer" cave into which a great quantity of water pours during heavy rains. Less than 75 feet from the surface it is blocked by washed-in surface debris.

The second cave extends about 200 feet in a westerly direction in alternating shale and limestone strata. The beds dip about 45°. The entrance has been closed because of danger from rock falls. (Fowler)

In Valley Forge State Park in a long abandoned limestone quarry densely overgrown, a small inconspicuous hole 20 feet up on the quarry face give access to a fairly large, steeply sloping room. A single passage east from this room parallels the quarry face and ends in a steep upturn about 80 feet from the room. The cave is traversed with great difficulty because of low roof, tight "squeezes", and the floor is covered with breakdown. The cave has little or no dripstone, and is clean and dry, at least in summer. (Dick Connolly, Ardmore)

Reference: 22

PHILADELPHIA COUNTY

CAVE OF THE WISSAHICKON

Cave of the Wissahickon, in the west bank of Wissahickon Creek a few hundred yards above its confluence with the Schuylkill, originally was a fault fissure. It was enlarged to a shelter cave, however, according to a well-substantiated story, by hermit monks in the late 17th century.

Reference: 22

GORGAS LANE CAVE

The cave is on the west side of Wissahickon Creek 800 feet north of the Mt. Airy Avenue bridge. It is 20 feet deep (horizontal) and is in the Wissahickon schist.

Reference: 9

MIQUON CAVES

Probably just within the Philadelphia County side of the Philadelphia Montgomery County line, 200 yards south of the Hamilton Paper Company plant in an old quarry east of the Pennsylvania Railroad tracks there are two caves in a talus pile of large boulders of altered talcose schist. According to U. E. Lutz of the Philadelphia Grotto, who visited the locality November 27, 1955, "the caves evidently were formed by giant slabs that fell from the high walls of the quarry. The entrance to the first cave is a small hole between large boulders. A passage descends steeply over rubble SE for 12 feet, then ascends steeply NE for 25 feet makes a sharp turn and goes almost straight up through dangerously loose rubble. The ceiling appears unstable and dangerous.

The second cave is about 50 feet up the talus slope toward the east end of the quarry. Two small holes between boulders open into an imposing room 12 by 30 feet below the entrances. In the lower levels more holes extend up, down, and sidewise through loose rubble, large enough to squeeze through, perhaps, but not with any reasonable margin of safety.

Reference: 20

STRAWBERRY MANSION CAVE

The Strawberry Mansion cave behind that mansion in Fairmont Park was filled some years ago by the city after a boy was stuck in it. It is a fault fissure in the Wissahickon schist running northeast from the Schuylkill about 100 feet.

Reference: 22

OTHER CAVES

In the late 18th century a family lived in a cave at the northeast corner of South York Road and Erie Avenue, Philadelphia. This is now a built-in area with no sign of a cave. (Parker)

Reference: 22

YORK COUNTY

BOOTLEGGER SINK

Bootlegger Sink (Figure 36) is on the property of John Emig 0.5 mile southeast of Emigsville. The entrance is in a shallow sink surrounded by trees, 250 feet southwest of a bend in the old road to Myers Mill. The cave got its name because in prohibition days it sheltered a moonshine still that was discovered accidentally by policemen searching the countryside for bank robbers. Because it was well known even earlier, in the late 1890's, it was used for the disposal of the carcasses of cattle killed in a train wreck on the North Central Railroad, 200 yards west of the cave.

The cave entrance five by 14 feet, drops vertically 30 feet to the floor of a room 33 feet long, 25 feet wide, and 15 to 30 feet high. Much of the floor is covered by a mound of debris that fell through the entrance pit, resulting in the floor at the sides of the room being eight to 15 feet deeper.

The west side of the room develops into a crevice through which a small stream enters and forms a pool that varies considerably in depth with the seasons. The stream leaves the pool through a submerged channel along the south wall. Near the middle of the south wall and close under the entrance pit an inconspicuous hole admits one to an enlargement of this channel. It runs northeast for 45 feet with a height and width of two to 14 feet. For 25 feet the stream flows through a trench in the clay floor; the inner part of the passage being occupied by a deep pool about 15 feet long and eight feet wide. Parts of this passage show signs of being flooded to the ceiling. Pencil stalactites are on the highest part of the ceiling.

Three passages, each at a different level, branch from the east side of the entrance room. They are up to 26 feet long and two to ten feet high. The upper level contains flowstone banks and the middle level has some fine rimstone dams. Small fragments of bones, some encrusted with travertine, litter the floors of both. The lowest passage, consisting mainly of a room ten feet in diameter, has a ceiling composed of a matrix of clay, rock fragments, travertine, and bones. This ceiling is level with a sloping ledge that protrudes from the floor levels of the higher passages.

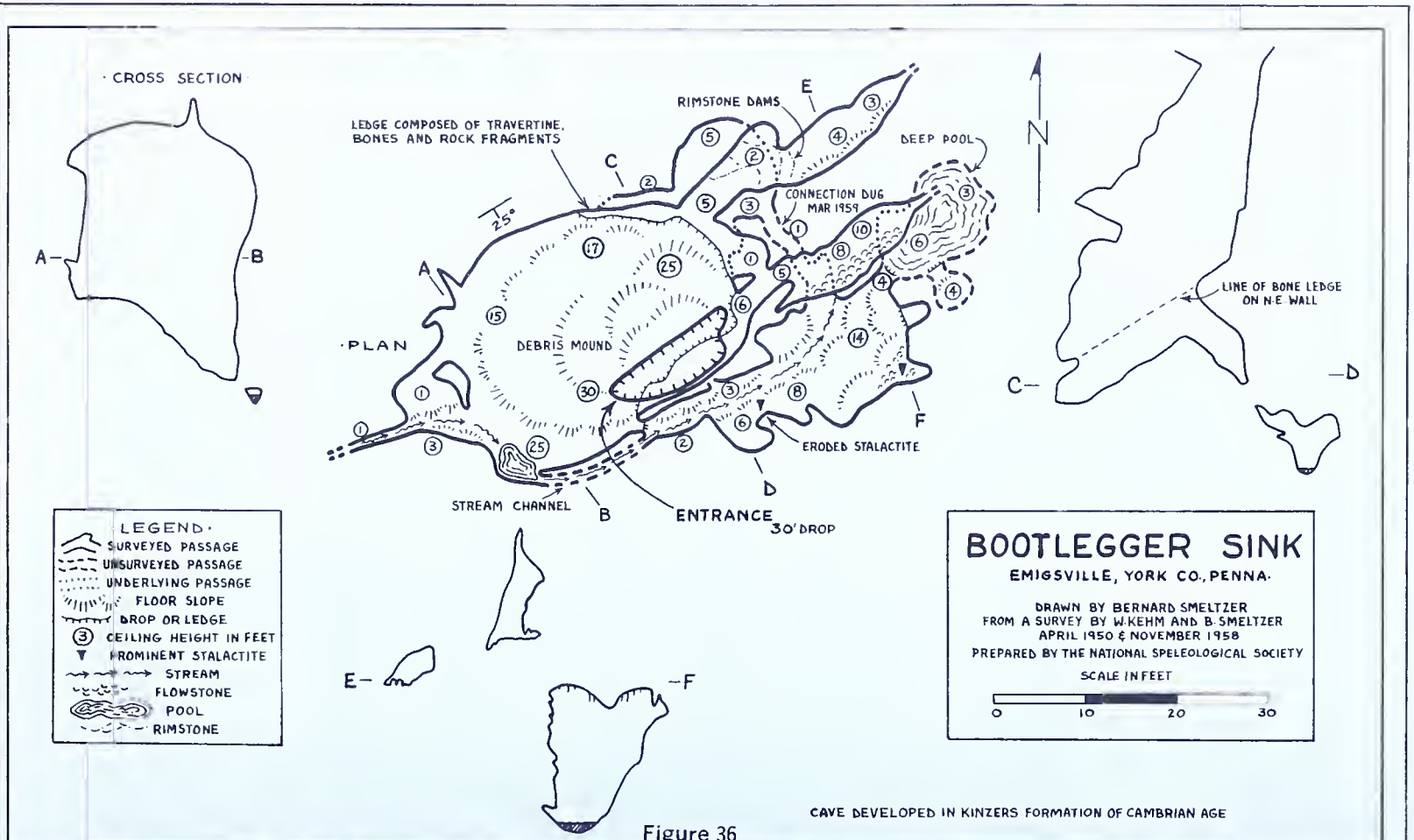

CROSS SECTION
A
B
PLAN
LEDGE COMPOSED OF TRAVERTINE, BONES AND ROCK FRAGMENTS
RIMSTONE DAMS
DEEP POOL
CONNECTION DUG MAR 1959
25°
DEBRIS MOUND
STREAM CHANNEL
ENTRANCE
30' DROP
ERODED STALACTITE
C
D
E
F
N
LINE OF BONE LEDGE ON N.E. WALL
LEGEND
SURVEYED PASSAGE
UNSURVEYED PASSAGE
UNDERLYING PASSAGE
FLOOR SLOPE
DROP OR LEDGE
CEILING HEIGHT IN FEET
PROMINENT STALACTITE
STREAM
FLOWSTONE
POOL
RIMSTONE
BOOTLEGGER SINK
EMIGSVILLE, YORK CO., PENNA.
DRAWN BY BERNARD SMELTZER
FROM A SURVEY BY W.KEHM AND B.SMELTZER
APRIL 1950 & NOVEMBER 1958
PREPARED BY THE NATIONAL SPELEOLOGICAL SOCIETY
SCALE IN FEET
0
10
20
30
CAVE DEVELOPED IN KINZERS FORMATION OF CAMBRIAN AGE

Figure 36

Apparently it is a remnant of an ancient floor level of the entrance chamber.

Bootlegger Sink occurs near the center of the Emigsville syncline. It is in knotty blue limestone and dark massive dolomite belonging to the Kinzers formation of lower Cambrian age. The strata dip 25° southeast and strikes north 52° east. Quarrying has obliterated a cave 500 feet southwest of Bootlegger Sink. Only a section of a passage wall partly covered with flowstone remains.

B. L. Smeltzer

COLMORU CAVE

Colmoru Cave (Figure 37) is located in the Medusa Portland Cement Company quarry one mile southeast of Taxville and 1.5 miles west of West York. The entrance is approximately 75 feet north of the entrance of Taxville Quarry Cave No. 2 and was revealed by recent soil stripping. Fragments of other caves have been found in the surrounding area.

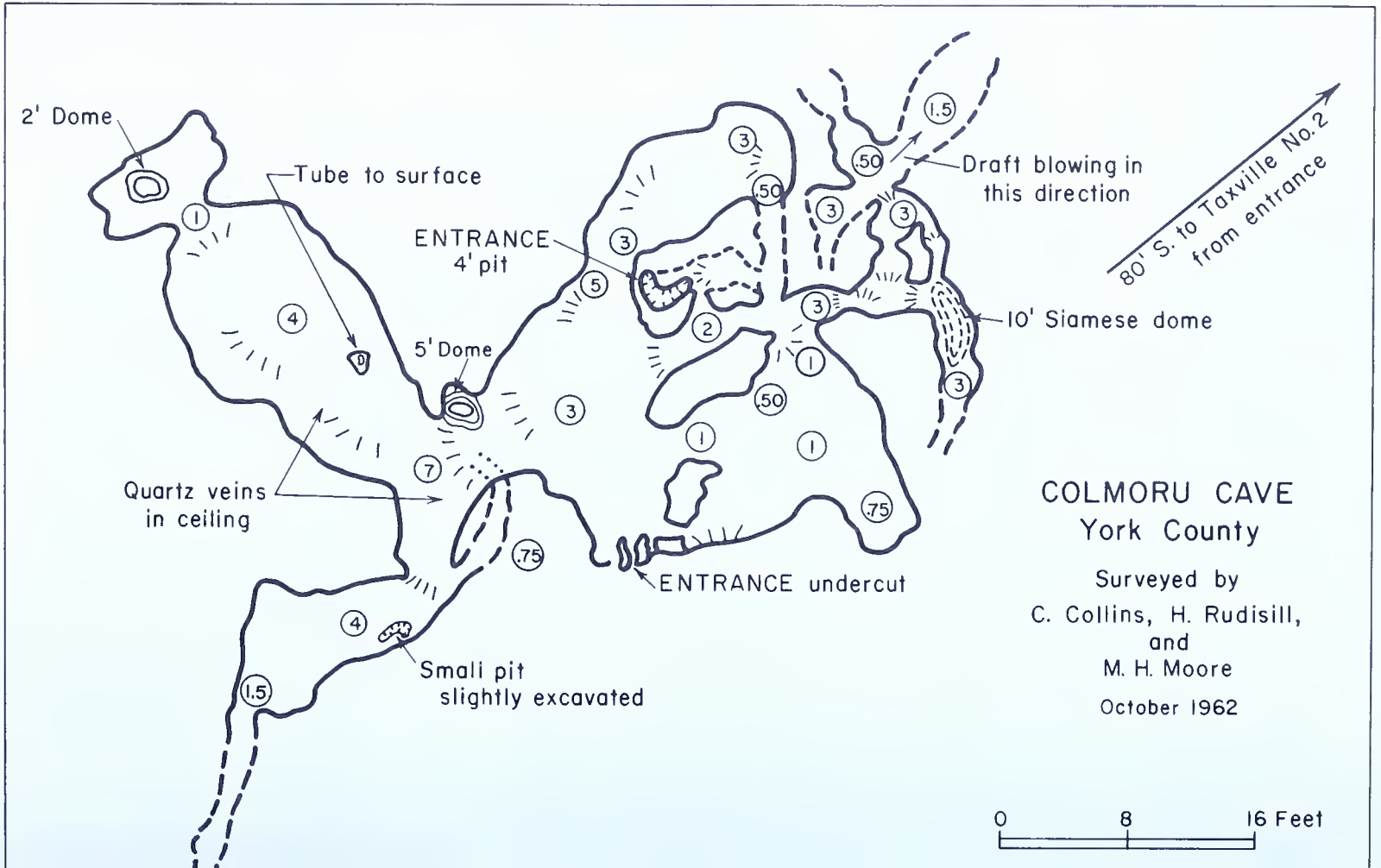
The entrance is a four foot pit which opens in the ceiling of a low room 20 feet in diameter. Two short passages lead from the north end of the room but terminate within 30 feet. A complex of small passages can be followed from the south end of the room for short distances to where they become too narrow for further progress.

The cave contains numerous bedrock pendants which often extend from floor to ceiling. From the evidence of twigs found sticking to the ceiling it is inferred that the cave floods at frequent intervals. The cave is in horizontal beds of gray and white spotted limestone and marble of the Kinzer Formation.

H. Rudisill

CONGLOMERATE CAVE

The cave is located west of Dillsburg at a place called Beavertown on the farm property of Mr. Hutton. The cave lies about 100 yards behind the Hutton home in what is reported to have once been a small quarry. Three lime kilns are along the path leading to the quarry. The quarry is about 100 yards in diameter and about 40 feet deep. The bedrock is a conglomerate and the cave has been formed by the solution of the limestone binder which allowed the conglomerate to disintegrate. A small but fast flowing stream enters the quarry on the northern side and sinks within 30 feet. High water spills over into a channel to the far end of the quarry where it enters the cave itself.


2' Dome
Tube to surface
ENTRANCE
4' pit
5' Dome
Quartz veins
in ceiling
Small pit
slightly excavated
ENTRANCE undercut
Draft blowing in
this direction
80' S. to Taxville No. 2
from entrance
10' Siamese dome
COLMORU CAVE
York County
Surveyed by
C. Collins, H. Rudisill,
and
M. H. Moore
October 1962
0
8
16 Feet

The cave was entered and an obstructing block of breakdown was chipped enough to allow passage to the area behind it. The passage is about 15 feet long and drops about ten feet where it enters a room which is about ten feet in diameter and about seven feet at its highest point. The floor drops to the south and is made up of loose material from the conglomerate surrounding it. At this point a passage was dug through into another room of smaller dimensions and a sloping floor. The walls of the passage and rooms are decorated with flowstone, stalactites, and some soda straws. Crickets were also plentiful.

The quarry fills at times with a considerable depth of water and suddenly empties itself with an audible gurgle. Wheat chaff put into the stream where it entered the cave was reported to come to the surface four miles away near William's Grove. Wheat chaff was seen clinging to the walls of the second room.

C. Miller and K. Miller

CRYSTAL PIT CAVE

Three miles southeast of Wrightsville, where Pa. Route 624 turns to run along the Susquehanna River toward Long Level there is a cave close to the road in Conestoga limestone (Figure 38). The entrance is a low crawlway. There is one irregular room 40 feet long and six feet high with much fallen rock. About 25 feet from the entrance a passage leads south ten feet to a large pool.

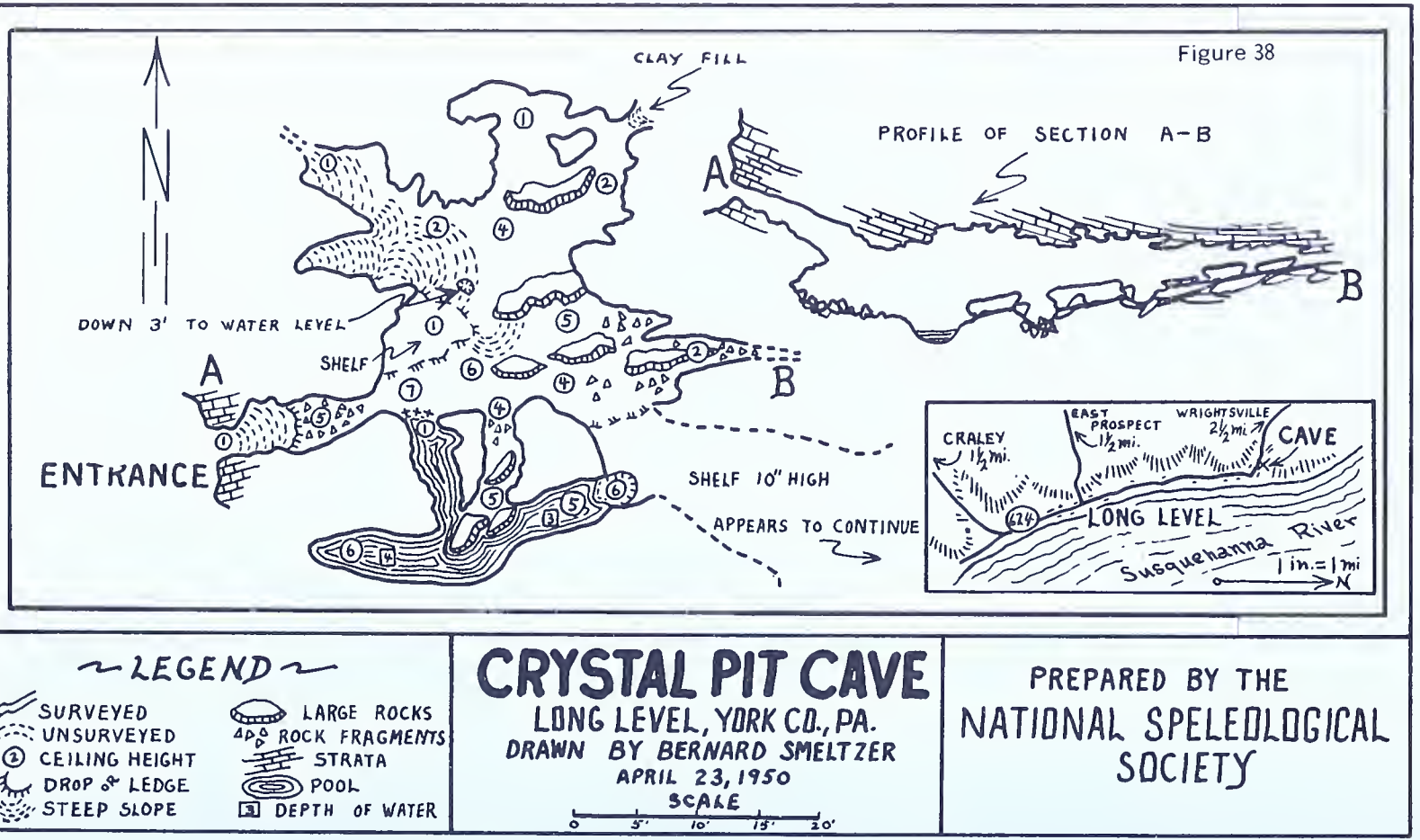
R. W. Stone (1953)

DEVIL'S HOLE ROCK SHELTER

The rock shelter (Figure 39) is located 2.2 miles north of Windsor near the edge of the Windsor Township line, 0.3 mile northeast of the Red Lion Reservoir. The entrance opens from a steep rocky hillside 100 feet above Cabin Creek. It can best be reached from the Jacob Smyser Game Reserve Clubhouse which is situated 0.3 mile north of the shelter and 1.5 miles south of Route 124 near Yorkana. The shelter and the steep-walled valley in which it is located are well known locally as the Devil's Hole.

The mouth of the shelter is ten feet wide and six feet high. The floor slopes inward and at ten feet the height of the ceiling lowers under a transverse cleavage plane. The passage continues northeast up a slight slope with a width of six feet and a height of three to five feet for 21 feet. The left wall slopes to the floor as narrow shelves. The floor is composed of a thin layer of black dirt. A low crawlway less than ten

Figure 38


CLAY FILL
PROFILE OF SECTION A–B
A
B
DOWN 3' TO WATER LEVEL
SHELF
ENTRANCE
SHELF 10" HIGH
APPEARS TO CONTINUE
CRALEY 1½ mi.
EAST PROSPECT 1½ mi.
WRIGHTSVILLE 2½ mi.
CAVE
624
LONG LEVEL
Susquehanna River
1 in. = 1 mi
N
LEGEND
SURVEYED
UNSURVEYED
② CEILING HEIGHT
DROP & LEDGE
STEEP SLOPE
LARGE ROCKS
ROCK FRAGMENTS
STRATA
POOL
③ DEPTH OF WATER
CRYSTAL PIT CAVE
LONG LEVEL, YORK CO., PA.
DRAWN BY BERNARD SMELTZER
APRIL 23, 1950
SCALE
0 5' 10' 15' 20'
PREPARED BY THE
NATIONAL SPELEOLOGICAL SOCIETY

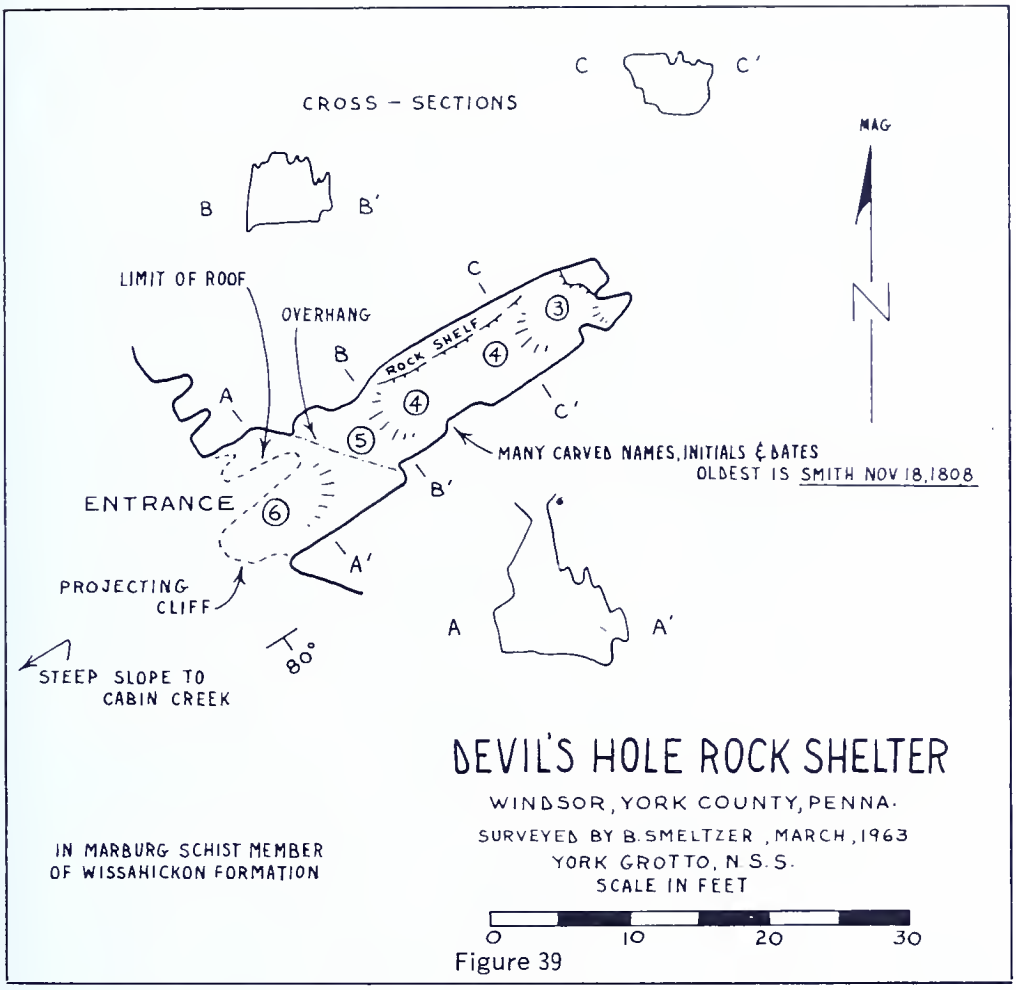


Figure 39

feet long occurs at the base of a rock face 15 feet higher and about 50 feet northeast of the rock shelter.

The Rock Shelter follows a joint the direction of which is N58°E through beds dipping 80° SE. The bedrock is the Marburg Member of the Wissahickon Formation at the edge of the Martic Line. Quartzites of the Harpers and Chickies Formations border the schist just north of the shelter. The cavity may be the result of erosion of a pocket of metabasalt.

B. L. Smeltzer

EAST YORK CAVE

Stripping residual clay from the limestone has revealed two cave entrances at the rear of the Glen-Gery Shale Brick Corporation plant at the east end of Boundary Avenue in southeast York (Figure 40). The

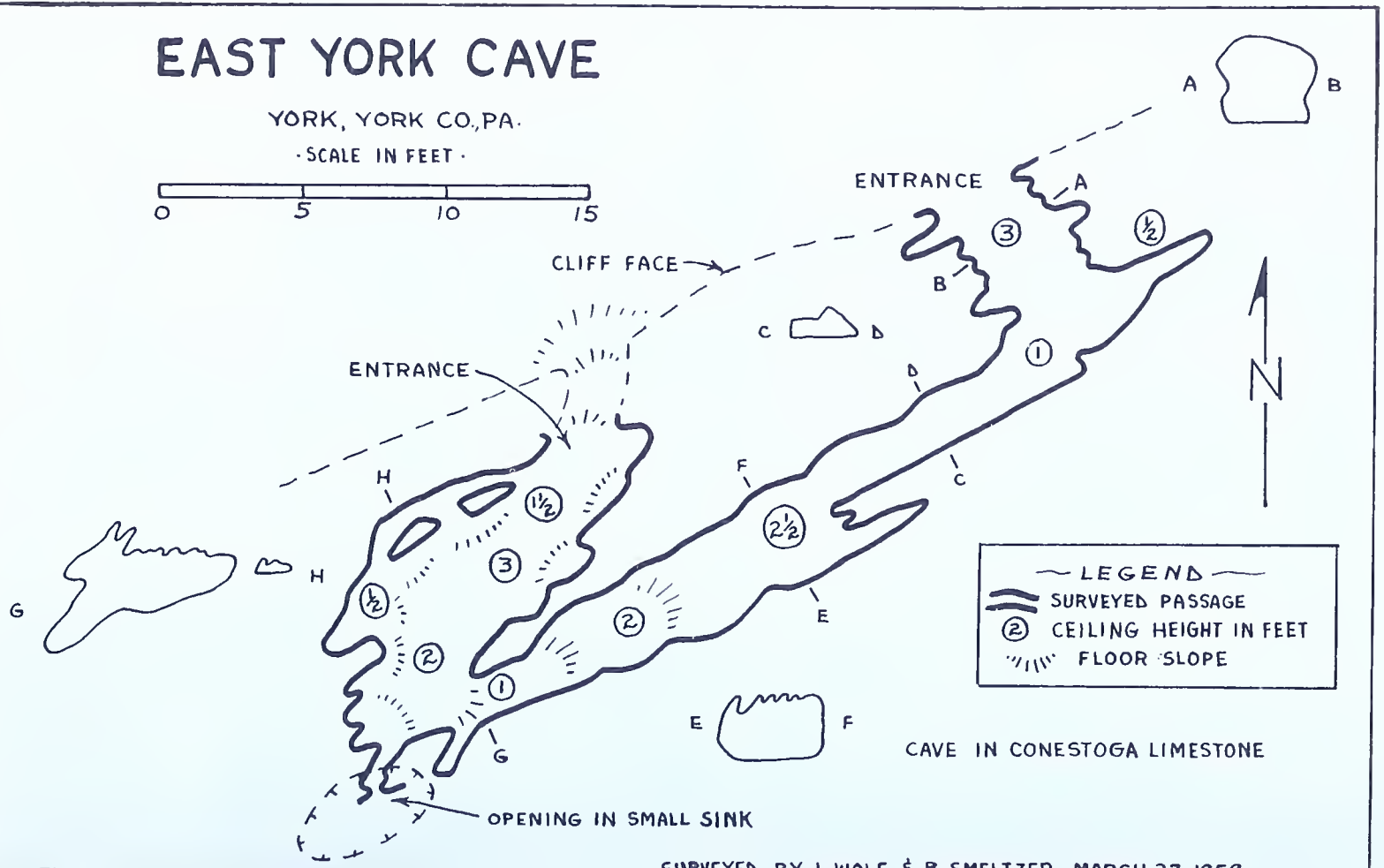

EAST YORK CAVE
YORK, YORK CO., PA.
· SCALE IN FEET ·
0
5
10
15
ENTRANCE
CLIFF FACE
ENTRANCE
OPENING IN SMALL SINK
A
B
C
D
E
F
G
H
N
LEGEND
SURVEYED PASSAGE
CEILING HEIGHT IN FEET
FLOOR SLOPE
CAVE IN CONESTOGA LIMESTONE
SURVEYED BY L. WOLF & B. SMELTZER MARCH 27, 1959

Figure 40

openings are in the northeast end of an outcrop that is about 150 feet long and 60 feet wide, consisting of strata dipping 75° southeast with narrow ravines paralleling the strike.

The larger opening is a three foot arch and passage running southeast seven feet across the strike, where it meets a low passage along the strike that pinches shut to the northeast, but can be followed in the opposite direction for 25 feet. It has a ceiling one to two and one-half feet high and a width of two to four feet.

The far end of this channel connects, after an upward squeeze, to a room one and one-half to three feet high, three to six feet wide, and 15 feet long. The north end of the room opens as the second entrance of the cave, and a low impassable hole at the south end opens at the bottom of a small sink near the top of the outcrop. Cave formations are lacking.

The cave is in Conestoga Formation, which is here a blue, thin-bedded micaceous rock with argillaceous partings. A thick calcite vein extends along the cliff between cave entrances.

B. L. Smeltzer

EMIGS CAVE

The entrance to this cave is in a prominent limestone ledge between a house and barn on the John Emig farm at the northeast end of Emigsville (Plate 12). An opening five feet wide and three feet high slopes down ten feet to a room 42 feet long, ten to 15 feet wide and three to six feet high trending N54°E. At mid-length there is a 12 foot chimney. The room's west side is along inclined bedding planes and the east wall follows a vertical joint plane.

At the base of the 12-foot chimney a crawlway with a solid rock flow leads down the bedding southeast for 14 feet. The floor is flat and the ceiling arched. The walls here are small arches plugged with laminated clay. This constricted tube with its grid of clay-filled branches is an excellent example of the phreatic feature known as bedding-plane anastomoses. The tube probably was cleared of its phreatic clay fill by vadose water, responsible for the formation of a jagged chimney above the entrance to it.

The tube opens into a small aperature in which one may almost stand erect. When the water table is high a pool stops further progress at this point. A low opening on the right can be seen to extend about ten feet where it seems to enlarge. Considerable digging would have to be done to enter here. A similar, though slightly larger, channel about a foot high trends N68°E for ten feet, where it develops into a fissure continuing for 34 feet. Here one crawls sidelong. Several six to eight inch stalactites and a small natural bridge are near the end.

During December, 1958 an excavation at this point disclosed an opening to a passage leading east. This branch is a meandering tunnel one to six feet high, two to six feet wide, and 105 feet long with varying cross sections. Some ceiling bowls contain small anthodites. At one place a short tunnel has been dug through a calcite-cemented gravel deposit. In the largest section of this passage a branch on the right leads to a stream channel too low to traverse. Near the far end of the passage this stream enters through a small hole, flows along the middle of the floor for ten feet, and disappears under a low ceiling. Tin cans at this point indicate an unknown opening to the surface. Though the stream is now intrenching a small portion of the clay floor, it could not have flowed continuously since the deposition of the gravel near the ceiling. The greater part of the floor is due to slumping of the clay fill and shows no signs of stream action.

Rockfall was observed only in the entrance chamber. The floor becomes increasingly sandy toward the far end of the cave.

The cave is in light-gray, knotty beds in the lower part of the Vintage dolomite that strike N65°E and dip 30°SE. The hill just north of the cave is composed of quartzite of the Antietam Formation.

B. L. Smeltzer

LISBURN CAVE

Lisburn, an old settlement in the big bend of Yellow Breeches Creek is in Cumberland County, but this cave is on the York County side of the creek (Plate 13). It is about 0.25 mile north of the bridge at the east end of the village, in a field east of the road, and marked by a clump of trees in a small sink.

Lisburn is in an area of Triassic sediments containing limestone conglomerate. The cave is in this conglomerate where it strikes EW and dips 20°N. The entrance is about ten feet wide and two to three feet high.

About 25 feet from the entrance the low passage about ten feet wide bends to the right or northeast and continues in a nearly straight course for 200 feet. It widens to 20 feet or more but the ceiling is only one to four feet high until a room is reached at about 200 feet. This room is about 40 feet across and ten to 12 feet high. Beyond this room a passage several feet wide but only two to three feet high turns right or southeast for 50 feet and then south. At this turn a room about 25 by 50 feet and five to 15 feet high and extending east is partly filled with huge fallen

blocks. The southern extension is a maze of small passages from a few inches to three feet high. Lisburn cave has about 700 feet of passages.

R. W. Stone (1953)

MARBLE CAVE

This cave was entered for the first time during October, 1959. Its location is 100 feet north from the corner of the south and west walls of the active wing of the York Stone & Supply Company quarry. The entrance is an irregular opening between large rocks in a depression 18 feet west of the quarry rim (Figure 41).

From the entrance a crawlway slopes down and to the south for ten feet. The low ceiling is at one place interrupted by a jagged chimney ten feet high with a network of protruding quartz veins. The top of the chimney opens to the surface as a small crack. The crawlway enlarges to a passage seven feet wide and three to five feet high which slopes down ten feet to a squeeze around a ledge.

Beyond the squeeze a room three feet to nine feet high and eight feet to 17 feet wide, entends south for 40 feet. At the entrance to the room vadose action has cut a trench through six feet of clay and gravel fill. The hard gravel-laden fill atop the phreatic clay most likely was deposited by the vadose stream which formed the ten foot chimney. Though the room is developed along bedding-planes, a prominent joint controlling its orientation can be seen extending across the entire ceiling. The level ceiling is broken at one spot by an elliptical cavity four feet deep and in line along the ceiling joint. This is a phreatic feature and unlike the ceiling cavity near the entrance.

The floor of the room slopes to the left, toward undercut lower walls. This slope of the cave fill was determined by recurrent water table ponding which slowly subtracted clay from the lower or east side of the room. A small patch of aragonite "whiskers" occurs along those walls.

At the north end of the room one can look through an opening six inches high and see that it continues for at least 25 feet, gradually enlarging. Considerable fill has been removed here in an attempt to enter this extension.

A joint-determined passage branches from the middle of the room's east wall. It emits a strong draft of air. This sinuous passage, two feet to six feet high and wide, trends east and northeast for 65 feet with mud-stained marble walls. A narrow impassable crevice continues 12 feet farther, ending in broken rock near the quarry face. Though of rather uniform width at floor level, numerous ceiling pendants split the upper

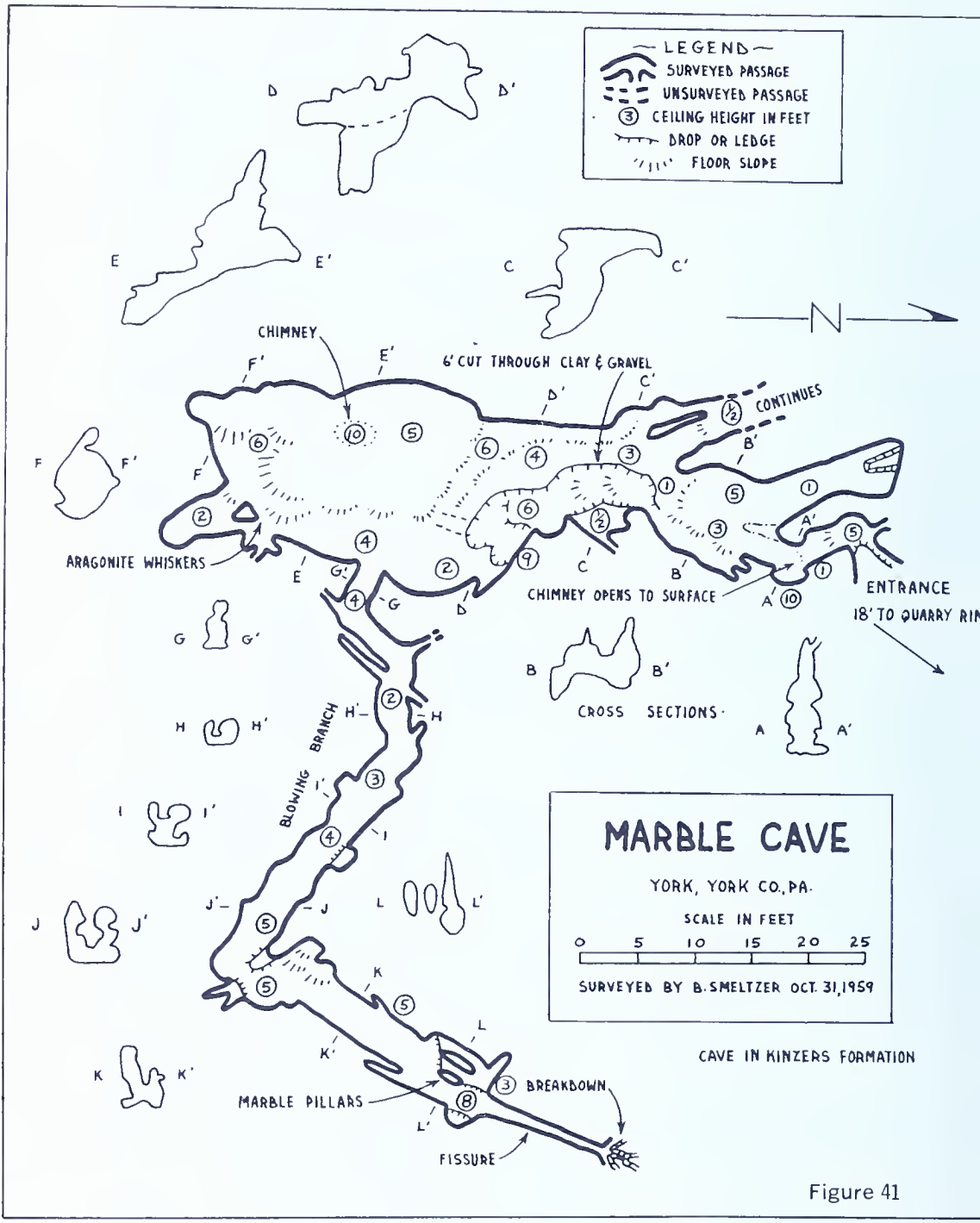

LEGEND
SURVEYED PASSAGE
UNSURVEYED PASSAGE
3 CEILING HEIGHT IN FEET
DROP OR LEDGE
FLOOR SLOPE
CHIMNEY
6' CUT THROUGH CLAY & GRAVEL
CONTINUES
ARAGONITE WHISKERS
CHIMNEY OPENS TO SURFACE
ENTRANCE
18' TO QUARRY RIM
CROSS SECTIONS
BLOWING BRANCH
MARBLE CAVE
YORK, YORK CO., PA.
SCALE IN FEET
0 5 10 15 20 25
SURVEYED BY B. SMELTZER OCT. 31, 1959
CAVE IN KINZERS FORMATION
MARBLE PILLARS
BREAKDOWN
FISSURE

Figure 41

walls of the passage into fissures and winding half-tubes. Two thin pillars of native marble are near the end of this passage.

Marble Cave is developed at the top of the middle member of the Kinzers Formation. The beds dip slightly northwest and consist of a white marble banded with arenaceous layers. A rock-filled ravine extending northwest from the entrance appears to be a roofless continuation of the cave.

B. L. Smeltzer

NORTH YORK CAVE

No cave in the York region has received so much attention as the cave along the Susquehanna Trail, 1.5 miles northwest of North York (Plate 14). The entrance is a small hole in an old limestone quarry 250 feet west of the road and near the WSBA radio station.

Moss-covered flowstone lines the quarry wall above the mouth of the cave. The small chamber just within is about 18 feet in diameter and two to six feet high. Except for a fissure on the east side, the ceiling is hemispherical with one inverted pothole. On the south side is the main chamber 38 by 43 feet and five to seven feet high. Floor and ceiling are conspicuously smooth. Low flowstone banks studded with short stalagmites cover the west wall. All surfaces are black with soot from explorers' torches. A passage ten feet wide and four feet high opens to the southeast. It is 30 feet long, narrowing to a crevice at the end.

The cave continues at the south side of the main chamber as a passage eight to 18 feet wide and seven to 12 feet high, with a downward-sloping floor strewn with breakdown. A travertine shelf, marking a previous floor level, extends from the floor of the main chamber and remains at this level along the east wall of the passage. After 22 feet there is an intersection with a gallery running northwest-southeast. At this point a fallen travertine slab six by nine feet and 14 inches thick obstructs passage. Apparently, it is part of the previously-mentioned ancient floor level and has fallen due to the removal of about 15 feet of supporting fill.

To the left the gallery extends 45 feet with heights ranging from six to 18 feet and widths of eight to ten feet. The walls are extremely irregular and pitted. A section of the ceiling 15 feet long is a travertine platform with slight air space above. Much of the gallery floor is flooded frequently with one to two feet of water. At the southeast end there is a room 32 feet long, six feet wide and three to five feet high. A crawlway 18 feet long branches off the west side of the room. It contains a pool in which isopods are abundant.

The northwest extension of the gallery splits 18 feet beyond the intersection into three continuations. Two are parallel fissures continuing

northwest; the third is a sinuous passage trending southeast for 35 feet. From this passage one can climb up seven feet to a 20-foot cross-passage connecting to the gallery at the fallen travertine slab. The northwest fissures have keyhole cross sections and can be entered five to seven feet above the floor. Much of the first fissure is a muddy passage two to six feet high and 45 feet long. Shallow pools follow the north wall past a small side lead containing speleothems. The second fissure becomes a canyon up to 20 feet high with large chunks of breakdown wedged in the rear portion. At 40 feet the canyon divides into four small branches that are choked with clay after 18 feet. Aragonite "whiskers" line sections of the canyon's north wall.

During September, 1959 members of the York Grotto opened a rock-choked chimney in the ceiling 25 feet west of the fallen travertine slab. The chimney leads up five feet to a low room 37 feet long which has been divided longitudinally by breakdown. Sizable stalactites were found lying loose on the clay floor. Anthodites and small helictites occur under a low ceiling at the south end of the room. In the room's lower division a small hole leading under the east wall has been enlarged and connected to an alcove overlooking the main gallery of the cave.

North York Cave is in the middle section of the Kinzers Formation, near the center of the Emigsville syncline. It is in massive beds of mottled blue limestone and contains wavy bands of argillaceous impurities (leopard rock). The beds dip 15° south. Nearly the entire ceiling of the cave is one bedding plane, little altered by solution, representing the upper sandy member of the Kinzers Formation. Fragments of trilobites have been found in the higher beds of the quarry but have not been noticed in the cave.

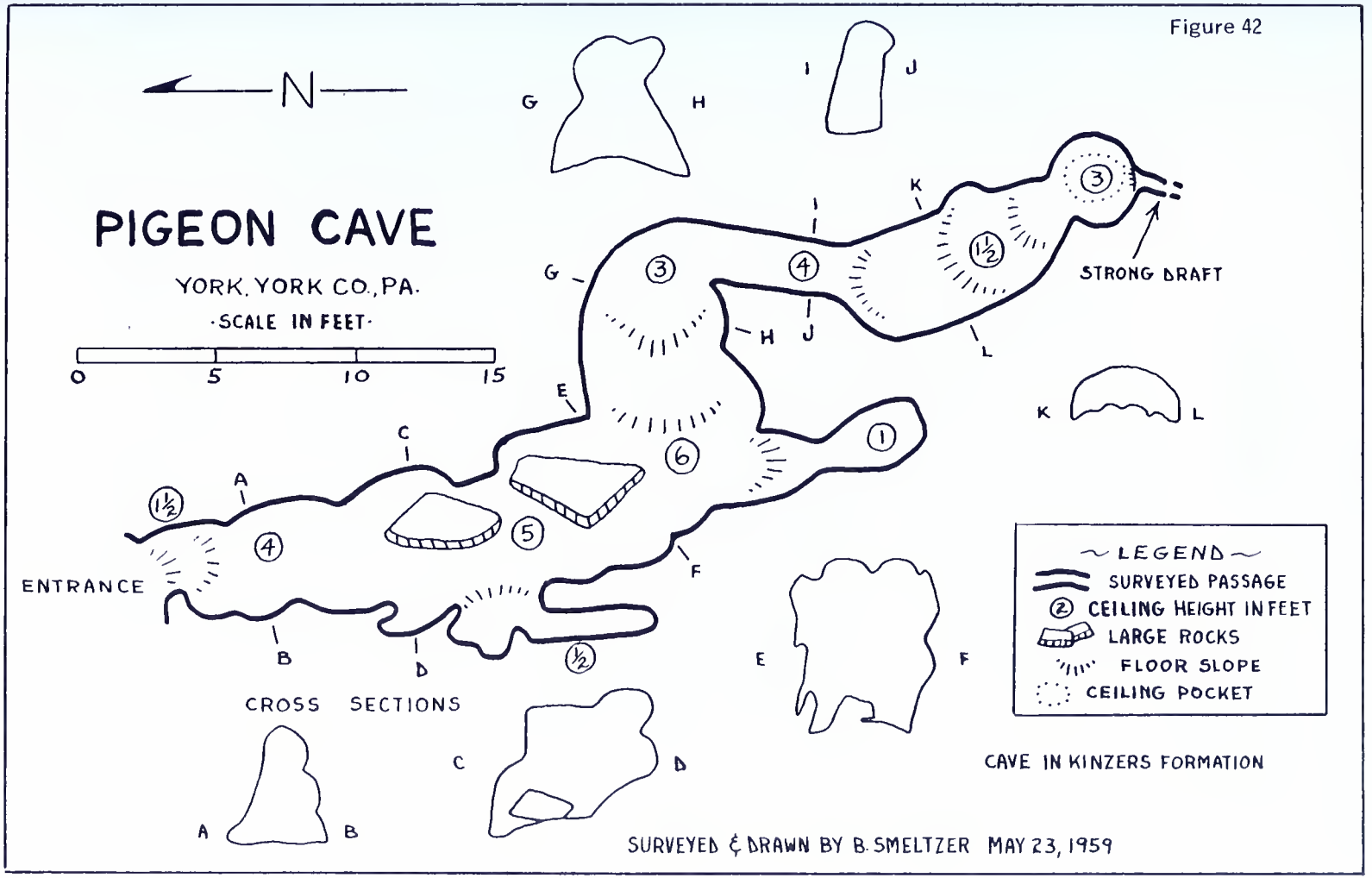
B. L. Smeltzer

PIGEON CAVE

This cave, in the south wall of the active section of the York Stone & Supply Company quarry on Roosevelt Avenue in York, is named for the numerous pigeons that nest in the cliffs at the entrance (Figure 42). It is 15 feet above the quarry floor close to the intersection with the abandoned southeast wall and about 100 feet west of the north entrance to West York Cave.

In May, 1959 the entrance was almost concealed by a large mound of crushed stone. The cave is a passage 1.5 to six feet high and wide running south 20° east for 38 feet. Just beyond two five-foot fallen blocks and 17 feet from the entrance the cave is offset five feet to the east. The inner

Figure 42


N
PIGEON CAVE
YORK, YORK CO., PA.
·SCALE IN FEET·
0
5
10
15
ENTRANCE
STRONG DRAFT
CROSS SECTIONS
A
B
C
D
E
F
G
H
I
J
K
L
~ LEGEND ~
SURVEYED PASSAGE
② CEILING HEIGHT IN FEET
LARGE ROCKS
FLOOR SLOPE
CEILING POCKET
CAVE IN KINZERS FORMATION
SURVEYED & DRAWN BY B. SMELTZER MAY 23, 1959

12 feet is a crawlway sloping steeply up over wet clay and thin rock plates, terminating in an oval aperture three feet high. At this point a small hole near the ceiling emits a strong draft of air. This is most likely an indication of a connection with West York Cave, a portion of which is only 30 to 40 feet from the far end of Pigeon Cave. The cave is in light gray magnesian limestone.

B. L. Smeltzer

RAILROAD ROCK HOUSE

This rock house or cliff shelter (Figure 43) is located 1.5 miles south of Glen Rock and an equal distance northeast of Railroad. The entrance, 22 feet wide and 11 feet high, is a conspicuously arched opening in a cliff about 75 yards east of the highway along the South Branch of Codorus Creek.

From the entrance a passage eight to 11 feet high and 12 to 20 feet wide extends northeast for 15 feet. Here there is a small alcove on the left and the passage turns, following an east-west course up dip for 20 feet with a height of six to ten feet and width of five to 12 feet. The passage is narrowest at the far end. At this point a tiny crevice at floor level and a shelf high on the wall extend perhaps five feet farther.

A wide expanse of albite-chlorite schist belonging to the Wissahickon Formation of the Glenarm Series extends northeast across southeastern York County from the Maryland state line to the Susquehanna River. In the vicinity of Glen Rock elongate areas of metabasalt are infolded in the Wissahickon Formation. Railroad Rock House appears to occur at the contact of schist and metabasalt. The cavity extends along a small fold in wavy discontinuous layers of rock striking N50°E and dipping 35° NW. The irregular structure of the beds is termed foliation. Metabasalt is much less resistant to erosion than the inclosing schist and the cavity represents the erosion of metabasalt folds within the schist. Some areas of the cavity's lower walls exhibit rusty porous remnants of the metabasalt. The occurrence of amygdules within metabasalt hastens the weathering processes. Garnets rimmed with chlorite are common in much of this formation.

The Rock House pattern follows a series of transverse cleavage planes which have sheared out portions of the recumbent folds within the rock. A smooth slip-cleavage plane forms the top right wall of the entrance and the termination wall.

B. L. Smeltzer

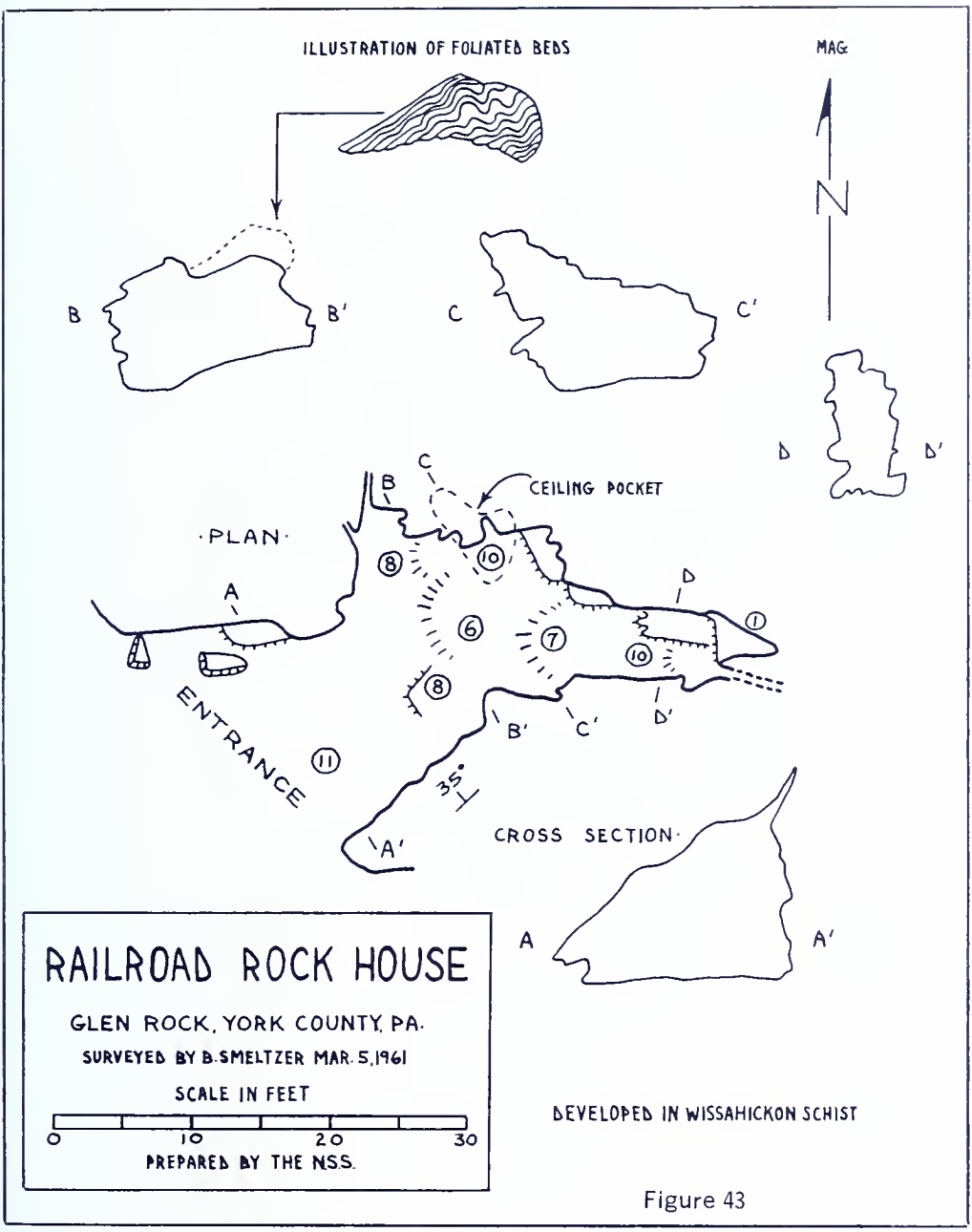


Figure 43

SANDY CAVE

Perhaps the most pronounced sinkhole development in the York district occurs on the William L. Cramer farm 0.03 mile west of Fahs Street and just north of the York Stone and Supply Company quarry. In flat meadowland along Willis Run, east of the farm buildings, nearly a

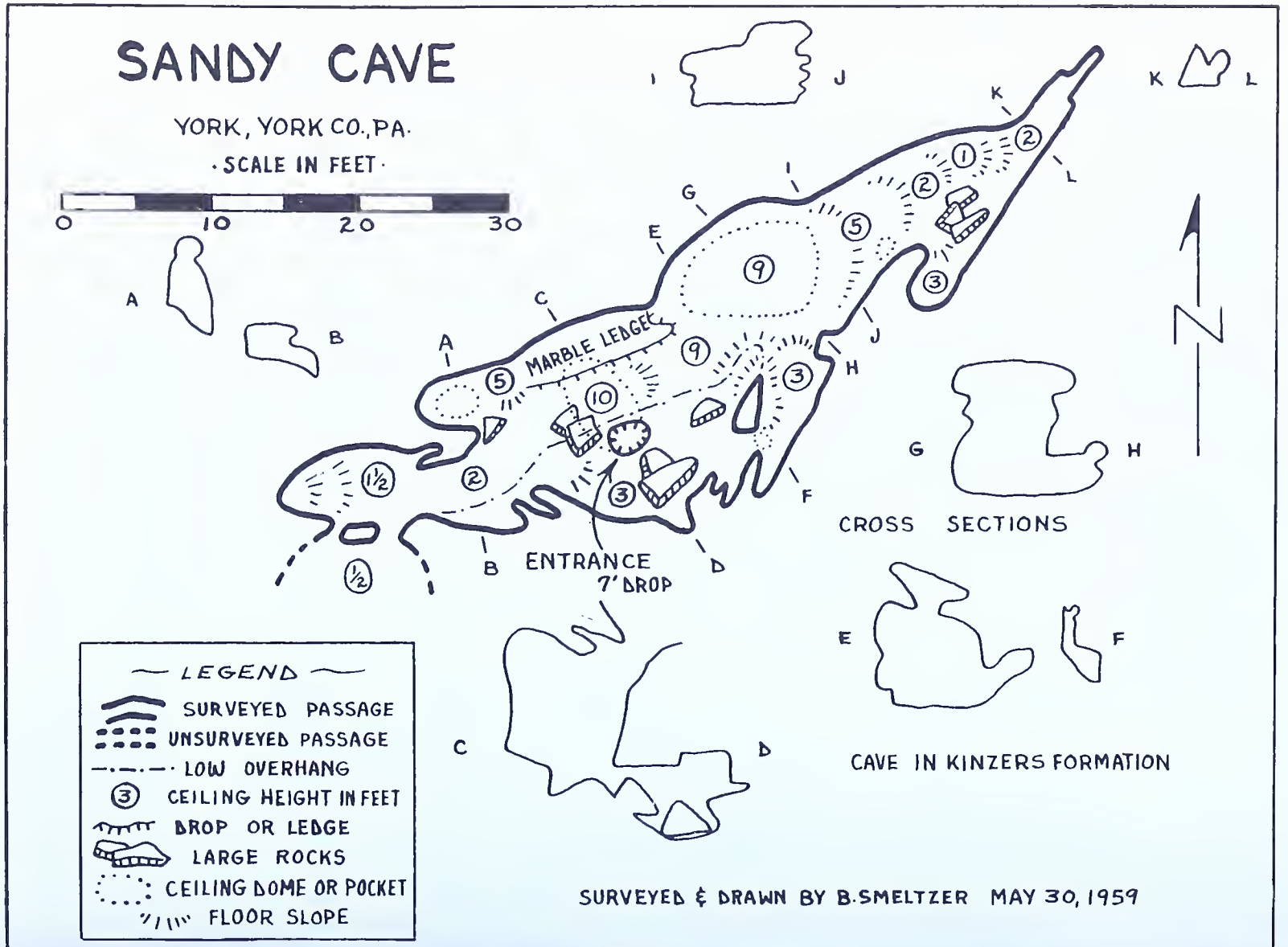

SANDY CAVE
YORK, YORK CO., PA.
· SCALE IN FEET ·
0 10 20 30
MARBLE LEDGE
ENTRANCE
7' DROP
CROSS SECTIONS
CAVE IN KINZERS FORMATION
SURVEYED & DRAWN BY B. SMELTZER MAY 30, 1959
LEGEND
SURVEYED PASSAGE
UNSURVEYED PASSAGE
LOW OVERHANG
CEILING HEIGHT IN FEET
DROP OR LEDGE
LARGE ROCKS
CEILING DOME OR POCKET
FLOOR SLOPE

Figure 44

dozen sinks, most of which have been filled with field stone, are quite recent and are reported to have been 15 to 20 feet deep.

On the south side of the quarry rim road, opposite the entrance to the Cramer farm lane, soil has been stripped in preparation for quarrying, exposing a profusion of vadose-sculptured knobs and ravines. The strata are the upper member of the Kinzers Formation and consist of large blocks of white marble among arenaceous and argillaceous layers. This structure is of organic origin and is related to the Cambrian Archaeocyathid reefs.

The cave entrance, about 15 feet from the road, is a hole two feet in diameter partly covered by large blocks (Figure 44). It opens through a ceiling dome with a vertical drop of seven feet to the floor of the cave. The cave is a single passage 60 feet long, three to 15 feet wide and one to ten feet high, following the strike. The greater part of the cave is northeast of the entrance. One so-called room contains a broad ceiling bowl.

Except for a marble ledge near the entrance, the walls are composed of brown earthy and sandy beds. Breakdown occurs along the undercut south walls.

The bedding dips 30° SE near the entrance but appears to be nearly horizontal at both ends of the passage.

B. L. Smeltzer

ST. MARKS CAVE

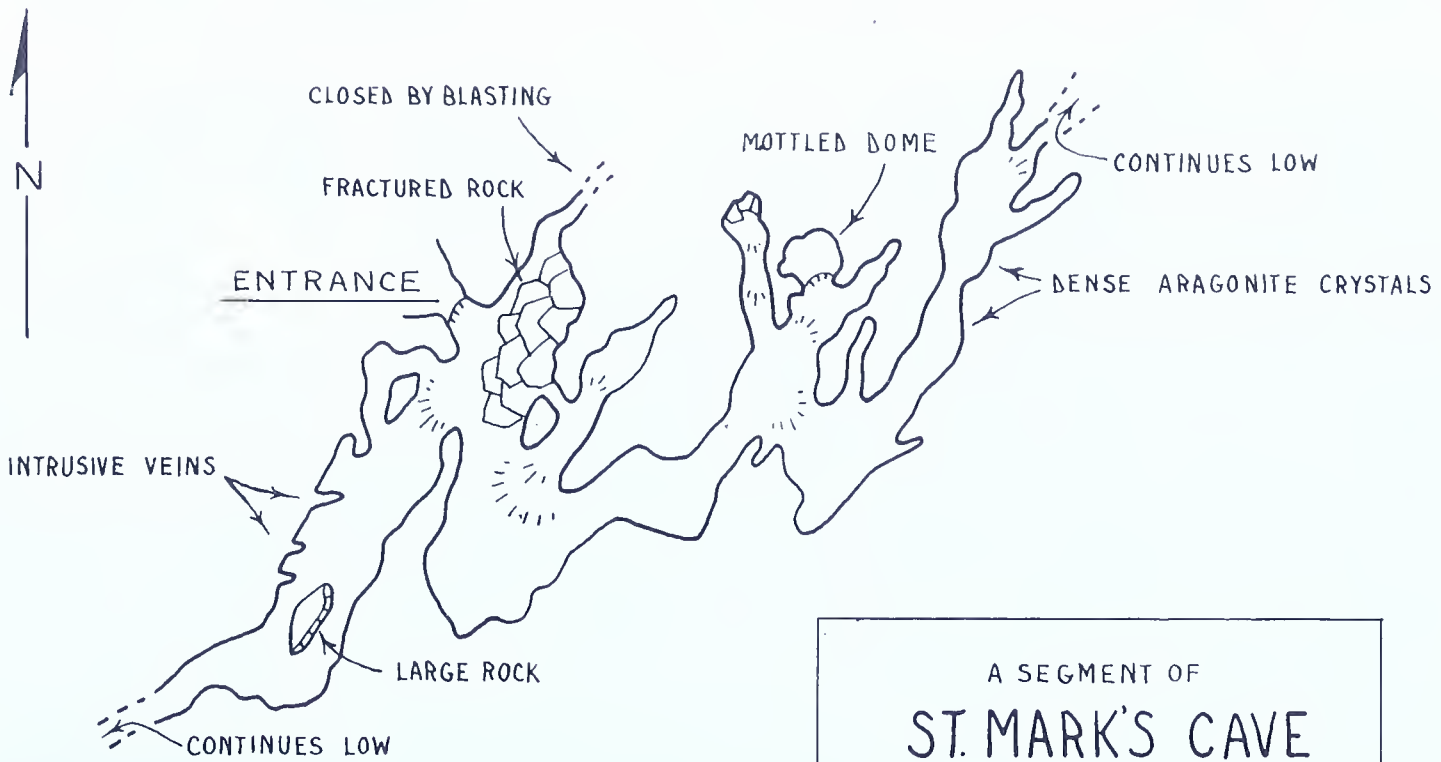
Construction work at St. Mark's Lutheran Church on East Market Street in York in spring of 1964 exposed a series of caves and solution openings just below the surface. A number of these were explored before being closed by further construction. The largest of these consisted of a 100 foot long irregular passage containing much breakdown (Figure 45). None of the caves remain open at the present time.

W. Cline

TAXVILLE QUARRY CAVES

Taxville quarry is one mile southeast of Taxville, 1.5 miles west of West York, and just north of Pa. Route 234 at S. Morgan Smith Plant No. 2. This quarry is owned by Medusa Portland Cement Company. Two caves are in the abandoned northwest side of the quarry (Plate 15).

Taxville Quarry Cave No. 1 is 280 feet northwest of the water pump building on the southeast side of the quarry pond. An opening 12 by 15 feet in the quarry face is part of a dome-pit. Two passages lead northwest


N
CLOSED BY BLASTING
FRACTURED ROCK
ENTRANCE
MOTTLED DOME
CONTINUES LOW
DENSE ARAGONITE CRYSTALS
INTRUSIVE VEINS
LARGE ROCK
CONTINUES LOW
A SEGMENT OF
ST. MARK'S CAVE
YORK, YORK CO., PA.
SURVEYED BY W. CLINE & B. SMELTZER
JUNE 4, 1964
PREPARED BY YORK GROTTO, N.S.S.
SCALE IN FEET
0 5 10 15 20 25

from it. The one on the right leads down eight feet to a slump pit six feet deep. A small stream follows a crevice at the bottom. The channel continues for 12 feet with a height of four to seven feet and joins the smaller entrance passage on a higher level. Stratified red clay occurs in the wall under a curious pendant resembling an inverted toadstool.

From the junction a smooth-walled tunnel turns left into a 7 foot square room containing a large fallen block. From here a passage five by 11 feet high follows a straight course N30°W 17 feet to the Bog Room. This room, with a floor of deep liquid mud, is 15 feet long, ten feet wide, and 14 feet high. A rim of impervious shale protrudes near the ceiling.

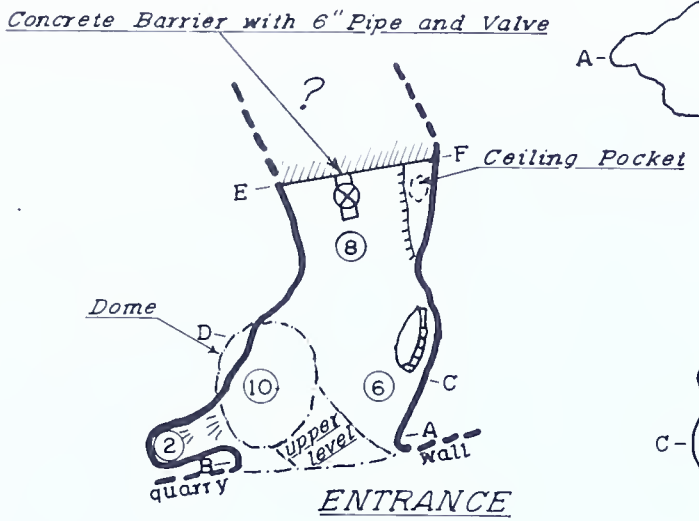
At the north end of the Bog Room there is a difficult climb up 11 feet to a low fissure running northeast. After eight feet, a floor of sticky red clay slopes down and a narrow fissure six to 12 feet high continues north, curving slightly to the east. The walls are scalloped into fantastic shapes. At 23 feet the fissure opens as a window 5 feet above the quarry floor and an impassable crevice turns west into a passage 9 feet long, 2 feet wide, and 4 feet high that also opens in the quarry face.

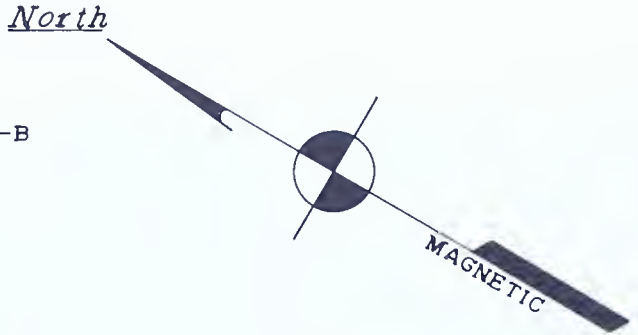
Taxville Quarry Cave No. 2 is in a grove of small locust trees 210 feet northwest of the main entrance to the first cave. This cave was uncovered by soil stripping 70 feet east of a quarry road. The two entrances are quite different though only 5 feet apart. One is a vertical vadose slot 10 feet long and 6 feet deep, the other a sloping crawlway almost blocked by a large rock. They shortly unite in a chamber 10 feet long, 8 feet wide and 5 feet high. On the left a small hole has been followed for 12 feet where it becomes impassable but can be seen to curve and extend farther. A short "keyhole" connects the west side of the chamber with a circular room 10 feet in diameter and 6 feet high. The floor is fine sand. A low passage running north is choked by sand fill after 7 feet. To the southwest a passage 4 feet high with curved walls leads up a rocky slope 15 feet and ends somewhat larger. In the ceiling a tiny hole opens to the surface and a pit leads down to a passage too low to explore.

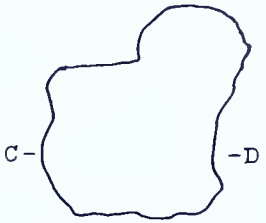
A small stream 250 feet south of the second cave drops over the edge of a wedge-shaped fissure 20 feet deep with vertically grooved walls. The bottom of the fissure is too narrow for traverse. This stream probably is the one seen in the slump pit of the first cave and in a similar crevice off the side of a collapsed cave room 50 feet east of the first cave. These narrow openings through which the stream flows appear to be entirely vadose in origin.

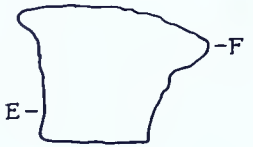
The Taxville Quarry Caves are in horizontal beds of white and pink, fine-grained marble belonging to the middle Kinzers Formation. These beds are overlain by Triasic sediments less than 0.5 mile to the north.

B. L. Smeltzer









THOMASVILLE CAVE

Thomasville, York County, Pennsylvania

July 30, 1965

SPELEO-RESEARCH ASSOCIATES
Marietta, Pennsylvania

Drawn and surveyed by
J. R. Reich, Jr.

THOMASVILLE QUARRY CAVE

In a quarry, south of Thomasville, formerly owned by J. E. Baker Co. and now property of Thomasville Stone and Supply Co. is a small cave. The cave is at the base of the eastern quarry wall (Figure 46).

From the entrance, an opening 10 feet wide and 6 feet high, a passage of similar proportions heads northeast 16 feet to a concrete barrier. Just inside the entrance a dome 10 feet high leads to an upper passage of short extent.

The concrete barrier completely seals the passage. A six-inch pipe and gate valve indicates that the bulkhead was constructed to keep water from entering the quarry operations. What lies beyond is a matter for interesting conjecture.

J. R. Reich, Jr.

WEST YORK CAVE

The York Stone and Supply Company quarry is on Roosevelt Avenue 1.5 miles northwest of Continental Square in York. The cave is in the southeast part of the quarry which has not been worked for more than two decades (Plates 16 and 17). A ledge leads down from the quarry rim to the first entrance which is in a cliff 35 feet above the quarry floor. A second entrance has been found at the top of a talus slope 215 feet farther north. Following a widely publicized rescue of several teenagers lost in the cave, the cave was closed to all visitors.

The first and larger entrance is 5 feet square. It opens into a room extending southwest for 40 feet. The quarry blasts have somewhat altered the ceiling which ranges from 5 to 18 feet high. A small hole at the west tip of the room leads to a 12 foot drop overlooking the highest gallery in the cave, being perhaps 20 feet high. At the south end of the room a channel pinches shut after 40 feet. The floor is deep with sandy silt. This material seems to have fallen free from the bedrock which is here a soft siliceous dolomite with a grid of quartz veins.

A sandy crawlway branches from the east wall. On the west a 6 foot drop and a channel through weirdly eroded arches extends down a slope ending at several small openings. One to the right enters a low room with a floor of fallen slabs. The far end of this room connects to the previously mentioned 20 foot high gallery. This crevice, caused by quarry blasts, reveals walls of glistening white marble. A mud slide to the left enters a wet room 35 feet long and 15 feet wide. It has been named the Crystal Room from the clusters of tiny black aragonite needles found on the lower walls.

The sandy crawlway extending east near the entrance room leads down to an interesting passage 65 feet long extending south. Here the bedrock is a hard marble with typical phreatic forms. The ceiling has an average height of six feet and contains shallow domes and pockets. The south end of the passage ends in the Big Room, a chamber measuring 57 by 25 feet. A circular basin in the ceiling is 7 feet in diameter. Near it a pendant nearly touches the floor for 15 feet. The floor is composed of red clay mounds. At the west end of the Big Room a low opening under the wall goes down to a room 25 feet square and 4 feet high. From here the crawlway continues following a straight course northwest for 50 feet along the strike. At this point it also enters the Crystal Room.

This circuit of irregular galleries, totalling 920 feet, forms a rough triangle.

At the west end of the Crystal Room a crawlway trends north for 73 feet. It averages 2 feet high but is up to 15 feet wide where there is a low sloping shelf on the right. This lead connects to an intricate arrangement of rooms constituting the north extension of the cave. Breakdown caused by the quarry operations has modified nearly all the original features of the passages leaving parts resembling a shattered mine tunnel. There are 650 feet of passages here.

At the end of the connecting crawl into the north section one goes through passages in platy, brown argillite. Blasting and souvenir collectors have destroyed most of the white stalactites in a side room. Fine specimens have been found among the floor rubble.

Another 30 foot crawlway opens into three sizable rooms. One first enters the King's Chamber which is 60 feet long, five feet to 15 feet high and up to 25 feet wide. The floor is completely buried under rockfall ranging in size from small slabs to blocks the size of an auto. A high ledge is decorated with white drapery and well-developed quartz boxwork can be found along the left wall. Several pits up to ten feet deep drop to small passages under the breakdown floor. Two branches at the north wall connect to a room 40 feet long, 6 to 10 feet high and 15 feet wide. An alcove along the east wall displays a number of helictites. Stalagmites and flowstone are on the west side. On the floor lies a massive chunk of translucent flowstone. At the far end of this room and low on the east wall a small hole leads down to the final cave room, 35 feet long and 15 feet wide. The second entrance to the cave, about 2 feet square, opens at the north end of this room. The West York Cave is developed in the Kinzers Formation of Cambrian age. The cave passes through beds varying considerably in composition; ranging from magnesian silicious and shaley bands to dense, pinkish marble. The bedding appears to dip about 20° northwest.

B. L. Smeltzer

WILLIAMS GROVE CAVES

Two small caves occur in the abandoned Williams Grove quarry in Tomstown dolomite 2.5 miles north of Dillsburg beside the Reading Railway tracks.

Williams Grove Cave No. 1 is a dry, dusty, narrow passage along a joint parallel with the quarry face. It is about 70 feet long, five to ten feet high, and 20 to 30 inches wide. The smoothly rounded walls have thin, sharp, projecting, quartz veins.

Williams Grove Cave No. 2 is in the opposite side of the quarry. It is a fissure 3 feet high which leads into a low passage dipping downward for 30 feet.

R. W. Stone (1953)

WILLIS RUN PIT

Willis Run Pit is located in the streambed of Willis Run approximately 150 yards upstream from the Roosevelt Avenue bridge in West York, Pa. (Figure 47) Willis Run is an intermittent stream and after a heavy rain a raging torrent creates a 20-foot waterfall in the entrance pit. Mud deposits constantly change within the cave during the period of flooding, causing low crawl passages to appear and disappear.

The entrance is immediately adjacent to and partially composed of the bed of Willis Run Creek. Depending on the stream level, the waterfall in the entrance may vary from a trickle to a roaring cataract of sufficient volume to make entry impractical. The drop is 20 feet. A cement cap over part of the entrance may indicate a former attempt to channel the creek from the cave.

The cave is developed in marble, probably of the Kinzer's Formation, Cambrian age. It consists of one room, measuring about 25 feet by 25 feet and averaging at least 15 feet in height. Considerable quantities of mud enter from the northern end. The stream follows a deeply descending passage to the south where it disappears into mud and breakdown. Large solution pendants here indicate a phreatic origin.

The two most unusual features of the cave, in addition to the waterfall entrance, are the fact that the cave room lies directly under Willis Run Creek (most of which by-passes the cave), and the unusually high temperature of the cave air and stream (86°F) when visited on April 4, 1968. The temperature was due to the hot water entering via the waterfall, from Willis Run Creek. The temperature of the creek was probably not natural.

Peter Hauer and Jim Young

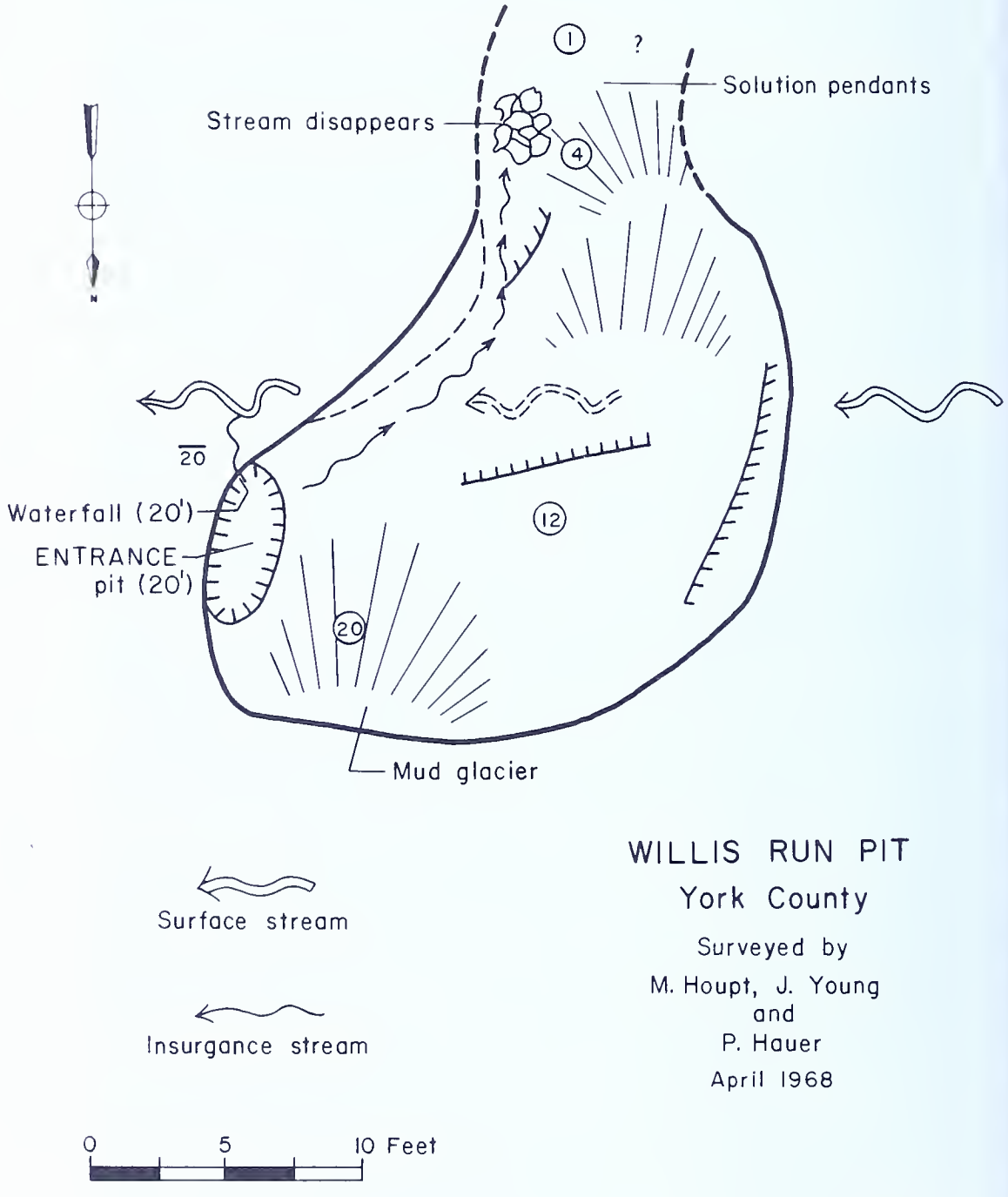

1
?
Solution pendants
Stream disappears
4
20
Waterfall (20')
ENTRANCE
pit (20')
12
20
Mud glacier
WILLIS RUN PIT
York County
Surveyed by
M. Houpt, J. Young
and
P. Hauer
April 1968
Surface stream
Insurgance stream
0
5
10 Feet

Figure 47

YELLOW BREECHES CAVE

Two small caves exist 1.4 miles north of Lisburn and 1000 feet down stream from a steel truss bridge over Yellow Breeches Creek.

Yellow Breeches Cave No. 1 is a fissure in limestone at creek level which extends about 50 feet. The fissure is high but only at the bottom is it large enough for one to crawl through.

Yellow Breeches Cave No. 2 is a rock shelter higher on the hill and a little south of the first cave. Its arched opening is three feet high and ten feet wide. The shelter is about 12 feet deep and at the back is five feet high and 20 feet wide.

R. W. Stone (1953)

REFERENCES

1. Anon. (1877), *Maytown—a natural curiosity—large cave near the town,* Marietta Times, v. 1, n. 22, April 21, 1877, (files in Marietta Town Hall Museum).
2. Anon. (1877), *The Maytown cave,* Marietta Times, v. 1, n. 23, April 28, 1877, (files in Marietta Town Hall Museum).
3. Anon. (Tom) (1877), *Another cave, Bainbridge, Pennsylvania,* Marietta Register, April 27, 1877. (Clipping from Raub scrapbook.)
4. Anon. (Tom) (1877), *The cave at Bainbridge,* Marietta Register, May 4, 1877. (Clipping from Raub scrapbook.)
5. Beck, Herbert (1953), *The governor's stables,* Lancaster Magazine, Lancaster, Pa., August 1953, p. 21.
6. Bretz, J. H. (1956), *Caves of Missouri,* Missouri Geol. Survey and Water Resources, 2nd ser., v. 39, 490 p.
7. Brison, D. N. and Ebersole, Michael (1966). *The Refton cave dive,* York Grotto Newsletter, v. 7, no. 4, p. 57-59.
8. Good, J. B. (1881), *History of Brecknock Township,* Daily New Era, Lancaster, Pa., August 4, 1881, p. 3.
9. Goodwin, B. K. (1964), *Guidebook to the geology of the Philadelphia area,* Pa. Geol. Survey, Gen. Geol. Rept. 41, 189 p.
10. Haldeman, S. S. (1881), *On the contents of a rock retreat in southeastern Pennsylvania,* Am. Philos. Soc. Trans. v. 15, p. 351-368.
11. Hanna, C. A. (1911), *The wilderness trail,* v. 1, New York, G. P. Puttman's Sons, footnote, p. 166.
12. Hyman, L. H. (1937), *Studies on the morphology, taxonomy and distribution of North American Triclad Turbellania. VIII. Some cave planarians of the United States,* Am. Miscroscop. Soc. Trans, v. 56 p., 452-466.
13. Jonas, A. I. and Stose, G. W. (1930), *Geology and mineral resources of the Lancaster quadrangle, Pennsylvania,* Pa. Geol. Survey, 4th ser., Atlas 168, 103 p.
14. Levi, H. W. (1949), *Two new species of cave isopods from Pennsylvania,* Acad. Nat. Sci. Philadelphia Notulae Naturae, no. 220, p. 1-6.

15. Lobeck, A. K. (1939), *Geomorphology*, New York, McGraw-Hill, 731 p.

16. Miller, B. L. (1934), *Limestones of Pennsylvania*, Pa. Geol. Survey, 4th ser., Min. Res. Rept. 20, 729 p.

17. Raub, M. W., *The first two scrapbooks of miscellaneous clippings marked "Papers read before the Linnean Society, Lancaster, Pa." (includes clippings of local note between 1870 and 1895)*, Pa. Collection, Fackenthal Library, Franklin & Marshall College, Lancaster, Pa.

18. Reich, J. R., Jr. (1963), *The Refton cave ecological survey*, York Grotto Newsletter, v. 4, no. 6, p. 80-85.

19. Sheller, Adam (1873), *Historical reminiscenses of Mount Joy*, Mount Joy Star, November 26, 1873.

20. Smeltzer, B. L. and Stone, R. W. (1956), *Many new caves found in southeastern Pennsylvania*, Comm. Pa. Dept. Internal Affairs Bull., v. 24, n. 5, p. 24-26.

21. Stone, R. W. (1932), *Pennsylvania caves*, Pa. Geol. Survey, 4th ser., Gen. Geol. Rept. 3, 143 p.

22. Stone, R. W. and Mohr, C. E. (1953), *Caves of Pennsylvania*, Natl. Speleol. Soc. Bull., v. 15, p. 38-139.

23. Stose, G. W. and Jonas, A. I. (1933), *Geology and mineral resources of the Middletown quadrangle, Pennsylvania*, U. S. Geol. Survey Bull. 840. 86 p.

24. Water, C. W. and others (1940), *Bowmanville youth hostel and trails*, American Guide Series, Pa. Writers Project, p. 3.

GLOSSARY

ANTHODITE — gypsum or aragonite that occurs as needle-like crystals radiating from a common base; also called cave flower.

ANTICLINE — an arch or convex-upward fold in layered rocks; rocks appearing in the core or center of the fold are older than those at the margins.

ARAGONITE — a white, yellowish or gray mineral composed of calcium carbonate; has a greater density and hardness than calcite.

ARENACEOUS — having a sandy texture.

ARGILLACEOUS — containing clay-size particles or clay minerals.

BEDDING PLANE — a planar surface that visibly separates each successive layer of stratified rock from its preceding or following layer; a plane along which a rock tends to split or break readily.

BOXWORK — a network of intersecting blades or plates of a mineral, deposited along fracture planes and from which the host rock has been dissolved.

BREAKDOWN — the process of collapse of the ceiling or walls of a cave; the accumulation of debris thus formed.

BRECCIA — a coarse-grained rock, composed of large, angular and broken rock fragments.

CALCITE — a common rock-forming mineral composed of calcium carbonate; major constituent of limestone; usually white, colorless, or pale shades of grey, yellow and blue; readily effervesces in hydrochloric acid.

CAMBRIAN — the earliest period of the Paleozoic era; thought to have covered the span of time between 570 and 500 million years ago.

CHIMNEY — a vertical passage or opening, having rounded walls. (also see *DOME PIT*)

DIABASE — a dark-colored, coarse-grained igneous rock whose main constituents are labradorite and pyroxene.

DIKE — a tabular, igneous intrusion that cuts across the planar structure of the surrounding rocks.

DIP — the angle that a structural surface, e.g. bedding or fault plane, makes with the horizontal; measured perpendicular to the strike of the structure (see *STRIKE*).

DOLOMITE — a common rock-forming mineral composed of magnesian carbonate; a carbonate, sedimentary rock consisting chiefly of the mineral dolomite or approximating its composition.

DOME PIT — a vertical passage or high chamber formed by solution, with a domed ceiling and vertical walls.

DRIPSTONE — a general term for any cave formation of calcium carbonate or other mineral formed by dripping water, including stalactites and stalagmites.

FLOWSTONE — a general term for any cave formation o calcium carbonate, formed by flowing wate on the walls or floor of a cave (also se *DRIPSTONE*).

GABBRO — a coarse-grained, dark-colored, igneous roc composed primarily of plagioclase (labra dorite or bytownite) and clinopyroxene.

GASTROPOD — any mollusk belonging to the class Gas tropoda; having a distinct head with eye and tentacles and a single, asymmetrica shell; e.g., a snail.

GNEISS — a foliated or banded rock, formed by re gional metamorphism; distinguished b texture, characteristic minerals and/o origin.

GRIKE — a vertical fissure developed by solutio along a joint.

GROTTO — a small cave, or one of the chambers of cave system, developed in limestone b solution.

JOINT — a surface of actual or potential fractur within a rock; usually planar and occur with parallel joints to form a joint set.

KARST — a type of topography which usually occur over limestone; characterized by caves o sinkholes and underground drainage.

KEYHOLE — a passage that in cross-section is round i the upper half and fissurelike in the lowe half.

LAPIES — in karst topography, solutional furrows c channels formed on the surface of lime stone, ranging in depth from a few mill meters to more than a meter and usuall separated by knife-like ridges.

LIMESTONE — a sedimentary rock consisting chiefly c calcium carbonate, primarily in the form of the mineral calcite.

MESOZOIC — an era of geologic time, from the end c the Paleozoic to the beginning of th Cenozoic.

OVERBURDEN loose soil, sand, gravel, silt or other unconsolidated material overlying bedrock, either transported or formed in place.

PALEOZOIC an era of geologic time from the end of the Precambrian to the beginning of the Mesozoic.

PHREATIC pertaining to or occurring in the phreatic zone. (see *PHREATIC ZONE*)

PHREATIC SOLUTION the solution action by ground water below the water table.

PHREATIC ZONE a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere (also called Zone of Saturation).

PLEISTOCENE an epoch of the Quaternary period after the Pliocene of the Tertiary and before the Holocene; the Great Ice Age.

PRE-CAMBRIAN all geologic time and its corresponding rock units before the beginning of the Paleozoic.

PYRITE a common, pale-bronze or brass-yellow, sulfide mineral.

QUARTZITE a very hard rock composed almost entirely of quartz grains which have been solidly cemented together.

SCHIST a strongly foliated, metamorphic rock which can be readily split into flakes or slabs due to the well-developed parallelism of the minerals present.

SINKHOLE a closed depression in an area of karst topography that is formed either by solution of the surficial limestone or by collapse of underlaying caves; a sink or limestone sink.

SODA STRAWS thin, tabular, hollow stalactites that maintain the diameter of one drop of water.

SPELEOTHEM any secondary mineral deposit that is formed in a cave by water action.

STALACTITE a cone or cylinder of calcium carbonate, deposited by dipping water, that grows downward from the roof of a cave.

STALAGMITE	a cone or cylinder of calcium carbonate, deposited by dripping water, that grows upward from the floor of a cave.
STRIKE	the direction or trend that a structural surface, e.g. bedding plane or fault plane, takes as it intersects the horizontal.
SYNCLINE	a fold, concave upward, the core of which contains rocks which are stratigraphically younger.
TRAVERTINE	a hard, dense, finely crystalline limestone, formed by rapid precipitation of calcium carbonate from solution and ground waters; occurs in limestone caves where it forms dripstone, flowstone, and rimstone in the form of stalactites, stalagmites and other cave deposits.
TRIASSIC	the first period of the Mesozoic era; thought to have covered the span of time between 225 and 195-190 million years ago.
VADOSE SOLUTION	the solution action by vadose water above the water table.
VADOSE WATER	water of the Zone of Aeration.
ZONE OF AERATION	a subsurface zone containing water under pressure less than that of the atmosphere, including water held by capillarity and containing air or gases.